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## JUST ABOVE NINETEEN MILLION MARK.

TOTAL OUTPUT OF ORE FROM THE LAKE SUPERIOR REGION IN 1900—RAIL SHIPMENTS OF 489,078 TONS—FINAL REPORTS FROM ALL THE MINES.

As was expected when navigation closed in December last, and the total output of iron ore by water from the Lake Superior region during 1900 was announced, the rail shipments, 489,078 tons (tons of 2,240 lbs. in all cases), have proven sufficient to bring the grand total up to nineteen millions. The exact figures are 19,059,393 tons. The shipments from the different ports, from the different ranges and from each of the mines, will be found in the following tables. A large table giving the output by mines since the first ore was shipped forty-six years ago will be found as a supplement to this issue of the Review. This table shows a total output from the beginning of 171,418,984 tons. The output of the last five years has been about 71,000,000 tons as against 100,000,000 tons for all the years between 1855 and 1895 inclusive. The Mesabi range last year contributed over 41 per cent. of the total.

SHIPMENTS BY PORTS AND ALL RAIL—GROSS TONS.

| | 1898. | 1899. | 1900. |
|---|---|---|---|
| Escanaba | 2,803,513 | 3,720,218 | 3,436,734 |
| Marquette | 2,245,965 | 2,733,596 | 2,661,861 |
| Ashland | 2,391,088 | 2,703,447 | 2,633,687 |
| Two Harbors | 2,693,245 | 3,973,733 | 4,007,294 |
| Gladstone | 335,956 | 381,457 | 418,854 |
| Superior | 550,403 | 878,942 | 1.522,899 |
| Duluth | 2,635,262 | 3,509,965 | 3,888,986 |
| All rail | 369,241 | 350,446 | 489,078 |
| | 14,024,673 | 18,251,804 | 19,059,393 |

SHIPMENTS BY RANGES—GROSS TONS.

| | 1898. | 1899. | 1900. |
|---|---|---|---|
| Marquette range | 3,125,039 | 3,757,010 | 3,457,522 |
| Menominee range | 2,522,265 | 3,301,052 | 3,261,221 |
| Gogebic range | 2,498,461 | 2,795,856 | 2,875,295 |
| Vermillion range | 1,265,142 | 1,771,502 | 1,655,820 |
| Mesabi range | 4,613,766 | 6,626,384 | 7,809,535 |
| | 14,024,673 | 18,251,804 | 19,059,393 |

MARQUETTE RANGE.

| MINE. | GROSS TONS. | MINE. | GROSS TONS. |
|---|---|---|---|
| Beaufort | 1,583 | Moore | 4,648 |
| Cambria | 80,432 | Negaunee | 126,829 |
| Champion | 113,743 | New York | 3,327 |
| Chester | 22,585 | Princeton | 75,037 |
| Cleveland Cliffs | 881,021 | Queen | 398,298 |
| East New York | 27,987 | Republic | 130,126 |
| Imperial | 62,321 | Richmond | 51,303 |
| Jackson | 31,714 | Starwest | 15,987 |
| Lake Angeline | 389,128 | Volunteer | 47,578 |
| Lake Superior | 709,143 | Webster | 20,797 |
| Lillie | 114,990 | Winthrop | 148,945 |
| Total | | | 3,457,522 |

MENOMINEE RANGE.

| | | | |
|---|---|---|---|
| Antoine | 119,940 | Hilltop | 6,410 |
| Aragon | 404,645 | Loretto | 61,219 |
| Bristol | 51,639 | Lincoln | 72,959 |
| Chapin | 929,937 | Lamont | 31,323 |
| Commonwealth | 53,342 | Mansfield | 90,155 |
| Columbia | 97,531 | Millie | 14,922 |
| Crystal Falls | 197,770 | Paint River | 1,316 |
| Cuff | 38,209 | Penn Iron Mfg. Co. | 197,606 |
| Cundy | 141,148 | Pewabic | 374,043 |
| Dober | 49,203 | Quinnesec | 25,967 |
| Florence | 35,756 | Riverton | 71,004 |
| Great Western | 98,550 | Sheridan | 8,063 |
| Hemlock | 72,413 | Verona | 5,143 |
| Hiawatha | 11,008 | | |
| Total | | | 3,261,221 |

GOGEBIC RANGE.

| | | | |
|---|---|---|---|
| Ada | 25,047 | Meteor | 7,844 |
| Ashland | 232,961 | Mikado | 1,090 |
| Atlantic | 135,955 | Montreal | 107,524 |
| Aurora | 193,111 | New Davis | 3,569 |
| Brotherton | 89,804 | Newport | 217,201 |
| Cary | 125,496 | Norrie | 666,389 |
| Chicago | 633 | Pabst | 239,242 |
| Colby | 32,572 | Palms | 139,658 |
| Germania | 986 | Pike | 3,434 |
| Hennepin | 7,728 | Sunday Lake | 74,097 |
| Iron Belt | 54,664 | Tilden | 481,909 |
| Jack Pot | 33,893 | Windsor | 488 |
| Total | | | 2,875,295 |

VERMILLION RANGE.

| | | | |
|---|---|---|---|
| Chandler | 644,801 | Savoy | 175,116 |
| Minnesota | 325,020 | Zenith | 60,089 |
| Pioneer | 450,794 | | |
| Total | | | 1,655,820 |

MESABI RANGE.

| | | | |
|---|---|---|---|
| Adams | 777,346 | Malta | 65,346 |
| Auburn | 263,692 | Mountain Iron | 1,001,324 |
| Biwabik | 924,868 | Ohio | 172,597 |
| Clark | 63,071 | Oliver | 244,876 |
| Commodore | 278,416 | Penobscot | 146,641 |
| Duluth | 128,587 | Pillsbury | 101,032 |
| Elba | 121,707 | Roberts | 41,965 |
| Fayal | 1,252,504 | Sauntry | 68,560 |
| Franklin | 168,524 | Sellers | 56,280 |
| Genoa | 253,651 | Sparta | 202,144 |
| Hale | 32,901 | Spruce | 101,675 |
| Kanawha | 64,218 | Stevenson | 56,031 |
| Lake Superior | 284,023 | Union | 8,297 |
| Mahoning | 911,021 | Williams | 18,238 |
| Total | | | 7,809,535 |
| Total all ranges | | | 19,059,393 |

## REPORTS FROM SHIP YARDS OF THE GREAT LAKES.

The visit of General Manager James Wallace and Mr. A. B. Wolvin of the American Ship Building Co. to Montreal, Ottawa and Halifax undoubtedly has to do with the plans of the company for acquiring a ship yard at some point below the canals of the St. Lawrence where ships built in parts on the great lakes for salt water service may be put together and where possibly the American company would also enter into the building of ships for ocean service in order to keep up a yard organization. Officials of the consolidated lake yards have been very quiet about their plans in this regard, but it is more than probable that they will shortly be in control of a yard in Canada. The people of Halifax are prepared to give decided encouragement to any kind of ship yard enterprise. A dispatch from that city says: "Halifax is prepared to negotiate with the capitalists who, acting apparently on an understanding with the Dominion Iron & Steel Co., propose to form a company to establish and operate yards for building steel vessels at Halifax and St. John. A special meeting of the Halifax city council was held recently to deal with the subject, and a crowd of influential citizens were present. A letter was read from C. Ochiltree Macdonald of the Gowrie and Blockhouse mines. In it Mr. Macdonald, who knows much about the steel ship building industry in the United Kingdom, said Halifax was a promising center for the industry, its distance of 300 miles from Sydney, the source of the material, not being a greater disadvantage than is to the Belfast ship yards the distance they have to bring their material. After some discussion a resolution was passed authorizing the appointment of a committee of six to act with six members of the board of trade to investigate the matter and report back to the council. A committee was appointed. A similar committee was appointed by the Halifax board of trade. By the board of trade committee the idea was favored that the city's aid to the enterprise should be in the form of a bounty of $2 per ton on every steamer built and put afloat, this arrangement to hold for five years. For a further period of five years the board of trade committee would give $1 per ton. The city council committee proposed another arrangement, which was as follows: A city subsidy of $6,000 a year if the proposed ship yards were constructed, and an additional subsidy of $4,000 a year if the establishment should include boiler and engine works, this for a period of twenty years. The promoters say that the steel ship building works they are to erect at Halifax will be as large as any in the world. Subsidies are expected from both the Dominion and the Provincial government, as well as from the city of Halifax."

Of the steel vessels under construction at different yards around the lakes, seventeen are building under the supervision of the Great Lakes Register of Cleveland, Capt. F. D. Herriman, surveyor general. The list includes four for Charles Counselman and two for C. W. Elphicke at Chicago; two for A. McVittie and one for D. C. Whitney at Detroit; one each for the Hawgood Transportation Co., for the Holland & Chicago line and for the Booth Packing Co. at Toledo; one for Chesborough Bros. and one for Samuel Neff at Port Huron; two for the American Navigation Co. at Cleveland; one for the Northern Navigation Co. at Collingwood, Ont. The register officials also have in hand fifteen vessels already in commission that are to be given ordinary classification.

It has been reported, several times of late, that the Lehigh Valley company would have constructed at the Buffalo works of the American Ship Building Co. two large package freighters in addition to the steamer now on the stocks. Negotiations for these vessels have been under way for some time past, but it is not probable that contracts will develop until the building situation is eased up by a general clearing of the stocks. The Buffalo yards have orders for repairs that will keep them very busy until the opening of navigation and some of the steamship companies have undertaken work of this kind on their own account. Among vessels now being repaired or on which operations well begin shortly are the steamers Vulcan, City of Venice, City of Paris, W. H. Stevens, Eber Ward, Avon, Portage, Bulgaria, Commodore, Australia, Buffalo, Troy, Ramapo, F. L. Vance, M. A. McLachlan, Mecosta and D. C. Whitney.

E. G. Crosby & Co. of Muskegon, Mich., entered into negotiations with the ship builders a short time ago for a combination car ferry and package freight steamer, to be of steel and to be operated summer and winter across Lake Michigan, but concluded to postpone the letting of a contract until next season.

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The average rate (tonnage average) at which all iron ore (nearly 12,000,000 tons) was moved from the head of Lake Superior (Duluth, Two Harbors, Superior and Ashland) during the season of 1900 was $1.2068. In order to determine this average, the representatives of the mining companies in Cleveland kindly furnished the Marine Review with statements showing number of tons shipped and freight paid on same.

### PIG IRON PRODUCTION DURING 1900.

The American Iron and Steel Association has received from the manufacturers complete statistics of the production of all kinds of pig iron in the United States in 1900; also complete statistics of the stocks of pig iron which were on hand and for sale on Dec. 31, 1900. The total production of pig iron in 1900 was 13,789,242 gross tons, against 13,620,703 tons in 1899, 11,773,934 tons in 1898, and 9,652,680 tons in 1897. The production in 1900 was 168,539 tons greater than in 1899. The following table gives the half-yearly production of pig iron in the last four years:

| Periods. | 1897. | 1898. | 1899. | 1900. |
|---|---|---|---|---|
| First half ..... | 4,403,476 | 5,869,703 | 6,289,167 | 7,642,569 |
| Second half ..... | 5,249,204 | 5,904,231 | 7,331,536 | 6,146,673 |
| Total ..... | 9,652,680 | 11,773,934 | 13,620,703 | 13,789,242 |

The production of pig iron in the second half of 1899 and the first half of 1900 aggregated 14,974,105 tons, or almost 15,000,000 tons. It will be observed that there was a decline in production in the second half of 1900 as compared with the first half of 1,495,896 tons. The production of Bessemer pig iron in 1900 was 7,943,452 tons, against 8,202,778 tons in 1899. The production of basic pig iron in 1900, all made with coke or mixed anthracite and coke, was 1,072,376 tons, against 985,033 tons in 1899. The production of spiegeleisen and ferromanganese in 1900 was 255,977 tons, against 219,768 tons in 1899. The production of charcoal pig iron in 1900 was 339,874 tons, against 284,766 tons in 1899.

The Association's statistics of unsold stocks do not include pig iron sold and not removed from the furnace bank, or pig iron in the hands of creditors, or pig iron manufactured by rolling mill owners for their own use, or pig iron in the hands of consumers. The stocks which were unsold in the hands of manufacturers or their agents on Dec. 31, 1900, amounted to 442,370 tons, against 63,429 tons on Dec. 31, 1899, and 338,053 tons on June 30, 1900. Included in the stocks of unsold pig iron on hand on Dec. 31, 1900, were 12,750 tons in the yards of the American Pig Iron Storage Warrant Co., which were yet under the control of the makers, the part in these yards not under their control amounting to 3,650 tons, which quantity, added to the 442,370 tons, above mentioned, makes a total of 446,020 tons which were on the market at that date, against a similar total of 68,309 tons on Dec. 31, 1899, and 342,907 tons on June 30, 1900. The total stocks in the above named warrant yards on Dec. 31, 1900, amounted to 16,400 tons, against 4,900 tons on Dec. 31, 1899, and 5,800 tons on June 30, 1900.

The whole number of furnaces in blast on Dec. 31, 1900, was 232, against 289 on Dec. 31, 1899, and 283 on June 30, 1900.

### DECLINE IN PINE LUMBER PRODUCT.

Lake shipping interests are, of course, very much interested in all that pertains to the pine lumber product of Michigan, Wisconsin and Minnesota. The permanent decline in this product is set forth in a recent report by the American Lumberman. This report, which covers operations for 1900, says that the last year the product passed the 8,000,000,000 mark was 1892, and now it has dropped below 5,500,000,000. The grand totals for the last eleven years in round numbers are as follows:

| | | | |
|---|---|---|---|
| 1900 | 5,485,261,000 ft. | 1894 | 6,821,000,000 ft. |
| 1899 | 6,056,000,000 ft. | 1893 | 7,326,000,000 ft. |
| 1898 | 6,155,000,000 ft. | 1892 | 8,594,000,000 ft. |
| 1897 | 6,233,000,000 ft. | 1891 | 7,880,000,000 ft. |
| 1896 | 5,726,000,000 ft. | 1890 | 8,597,000,000 ft. |
| 1895 | 7,050,000,000 ft. | | |

During the last two years there has been every inducement for the mills to turn out a heavy product, and yet there was a slight falling off in 1899 as compared with 1898, and a heavy decrease in 1900. Every resource was strained to make a heavy output, but without result, except to prove that at last the closing years of the white pine industry of the northwest, as one of great magnitude, are at hand. With such results it must be admitted that the product will decrease annually until it reaches a point where, by the adoption of preservative forestry methods, it can permanently be maintained.

The decrease is not confined to any particular part of the white pine territory, but is seen in Minnesota as well as in Michigan. West of the Chicago district the total for 1900 was 4,077,000,000 ft., against 4,401,000,000 ft. in 1899. This includes the mills west of Lake Michigan, except those along the Green bay shore and in the upper peninsula of Michigan. Every district in this territory but two shows a decline. Even Minneapolis and upper Minnesota cut less in 1900 than in 1899. The Mississippi river below Minneapolis, however, cut 562,000,000 ft., against 504,000,000 ft. in 1899, and the Wisconsin valley 613,000,000 ft., against 542,000,000 ft.

The mills in the Chicago district—including those on Lake Michigan and in the upper peninsula of Michigan—cut 1,056,810,000 ft. in 1900, against 1,150,721,000 ft. in 1899. The heaviest percentage of decrease was naturally found with the mills on Lake Huron waters.

The grand total of stock on hand at the mills or primary points on Dec. 31 last was 2,839,705,000 ft., against 2,728,271,000 ft. at the same date in 1899, 1,494,739,000 ft. in 1898, 3,915,558,000 ft. in 1897, 4,053,937,000 ft. in 1896 and 4,180,360,000 ft. in 1895. It is to be noted that there was a decrease of 58,000,000 ft. west of the Chicago district, where is produced three-quarters of the entire output. There is thus shown a heavy falling off in shipments for 1900 compared with 1899, and yet stocks are nowhere near the old-time standard either in actual quantity or compared to the output.

The total shingle output of the pine and hemlock mills of the northwest for 1900 was 2,400,000,000, against 2,899,000,000 in 1899. This reduction followed that in lumber, but shows that the output of shingles is holding up much better than that of lumber. It is about the same as that of 1895 and 500,000,000 larger than that of 1896. The territory west of the Chicago district produced 969,000,000 shingles in 1900, the Chicago district 917,000,000 and the eastern part of the field 514,000,000.

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The twin-screw dredging steamer Sabine, recently built by the Townsend & Downey Ship Building & Repair Co., Shooter's Island, N. Y., for the United States government, was given a series of trials, both for speed and dredging, last week, in which she was highly successful. She will be employed at Sabine Pass.

### REORGANIZATION OF PENNSYLVANIA STEEL CO.

President Fulton of the Pennsylvania Steel Co. has sent out the following circular to the stockholders of the company:

"The volume of your business has increased from sales of $6,873,590.75 in the year 1896 to $19,693,848.79 in 1900. Your capitalization remains the same, and in the opinion of your directors is wholly inadequate to handle your present transactions with advantage and is an absolute barrier to future growth. Both your share capital and your bonded debt are comparatively small and do not represent either the present intrinsic value of your plants or their earning capacity as income producers for the future, with its outlook for increased foreign and domestic trade. The total amount of your bonded debt outstanding upon both your Steelton and Sparrow's Point plants is $6,500,000, and your share capital is $6,500,000, or $13,000,000 in all. The actual value of these properties, as they exist today, is in excess of $20,000,000. In order to properly develop their capacities and to keep up with the progress in the art of steel making in its various branches, and of ship building, not only must large sums be spent immediately for improvements and for the acquirement of cheap fuel and ore, but means must be provided for similar expenditures when necessary in the future.

"Your directors wish to place the situation fully before those whom they represent. It is impossible for your company to continue in business with profit to its owners unless ample capital is now contributed in cash and additional stock held in the treasury unissued but available for use when required in the future. The profits of the past two years have been large, and, except a small sum paid in dividends upon preferred stock, every dollar of them remains in active use in your business. The year of 1901 opens auspiciously, and in some departments the company has already sufficient orders to keep them running the entire year. Raw materials cannot be bought to advantage on credit; their manufacture, shipment and delivery consume time, during which period very large sums are necessarily invested. Your directors have formulated a plan to increase your resources and take advantage of the business offered; they consider it the best method for the purpose, and they recommend it in the strongest manner for your acceptance. Immediate action must be taken."

The new corporation is to be named the Pennsylvania Steel Co. and is to be incorporated under the laws of New Jersey. The stockholders are given until March 15 to assent to the plan of reorganization, which accompanies the circular.

### SEEKING AMENDMENT OF CANADIAN RULES OF THE ROAD.

Capt. A. B. Wolvin, president of the Lake Carriers' Association, has lately been in Ottawa interviewing the minister of marine in reference to a proposed change of the Canadian rules of the road to conform to the White law, in use by United States vessels on the great lakes. In writing to Mr. Harvey D. Goulder, counsel of the association, upon the subject, he thinks that the Canadian government would effect a change, but is of the opinion that it would be necessary to have someone visit Ottawa on behalf of the Lake Carriers. Capt. George P. McKay, chairman of the committee on aids to navigation, will visit Ottawa in a couple of weeks and will arrange to have Mr. Thomas Donnelly, chief inspector of the Canadian Inland Lloyds, meet him there to take up the subject with the Canadian officials. They will receive the assistance of Mr. W. J. White of Montreal, who has devoted much study to Canadian maritime interests. Mr. Thomas Donnelly directed attention to this matter at the annual meeting of the Lake Carriers' Association in Detroit early in the present month. Vessels of Canada, alike to all vessels of British register, some time ago adopted the rules of the road formulated by the International Marine Conference. As all vessels of the United States are navigated in accordance with the White law, a special act of congress for the great lakes, the rules for vessels of Canada and vessels of the United States on the great lakes are at variance in many ways.

### UNITED STATES TUBE CO.'S NEW PLANT.

Promoters of the United States Tube Co., a West Virginia corporation capitalized at $1,000,000, announce that ten acres of land in the Kensington district, Buffalo, have been purchased by the company at a cost of $25,000. A large steel tube plant is to be erected upon the land for the employment of 500 men. According to Mr. Harvey K. Flagler, who is president of the company, ground for the plant will be broken in ten days and the plant will be in operation within six months. The company will manufacture lap-welded steel and iron boiler tubes for locomotives, marine, tubular and stationary boilers; lap-welded steam, gas and water pipe, oil well tubing, casing, pipe lines and structural steel tubing. Present plans call for a daily output of 100 tons of tubes, but the company expects to increase the capacity of the plant constantly until its daily output is 500 tons and the working force is from 4,000 to 5,000 men. Mr. Flagler says that this estimate is in accord with the growth of the industry as shown by steel industries throughout the country.

### THE INDUSTRIAL STOCKS.

With the rapid formation of big industrial organizations in the past two years, it is probably unfortunate Wall street has more influence than in the past on the industries associated with iron and steel. Bradstreet's says of the stock market in this regard:

"While extreme declines in the iron and steel industrial stocks have ceased, the position of that part of the share list continues to be uncertain and exercises a more or less unsettling influence upon the securities market generally. The intimations that some exceedingly large combination of interests was at hand now seem to be without tangible foundation, but, on the other hand, Wall street is led to believe that the danger of any extreme competition between important manufacturing concerns in such lines may be averted, or that the effects may be modified by mutual agreements and understandings. It is also claimed in speculative circles that any unfavorable symptoms in the iron trade situation have been exaggerated for speculative effect, and that the manipulators who were alleged to have made use of such arguments to favor bearish operations are now acting on the bull side of the market. At the same time, the reduction of the dividend rate upon one of the prominent industrial stocks has had a rather unfavorable influence, as the concern in question was understood to have enjoyed a prosperous year in 1900, and it would, indeed, seem that the expansion of its business has been the chief reason for a reduction of its dividend payments."

### EXHIBITS AT THE CONVENTION OF MARINE ENGINEERS.

Manufacturers of auxiliaries for marine engines and steam specialties of all kinds were represented in large numbers at the annual meeting of the National Marine Engineers' Beneficial Association, which closed at the Colonial hotel in Cleveland a few days ago. Prominent among the different displays was a large parlor full of tubes and other products of the Shelby Steel Tube Co. The Shelby company was represented by Mr. J. J. Lynn of Port Huron, who is in charge of marine sales and who is acquainted with ship builders and marine engineers in all parts of the country. Mr. Lynn was assisted by his brother, George Lynn, and another of the brothers, D. E. Lynn, was also constantly in attendance at the convention, as he represents on the great lakes the National Lead Co. of 100 William street, New York. The National company's exhibit was, of course, in this case devoted more to their line of metal used by the engineers than to the lead and colors used for paint. This company was also represented by Mr. C. Lindsley, Mr. C. C. Foerstner, Cleveland manager, and Mr. W. P. Shook, also of Cleveland.

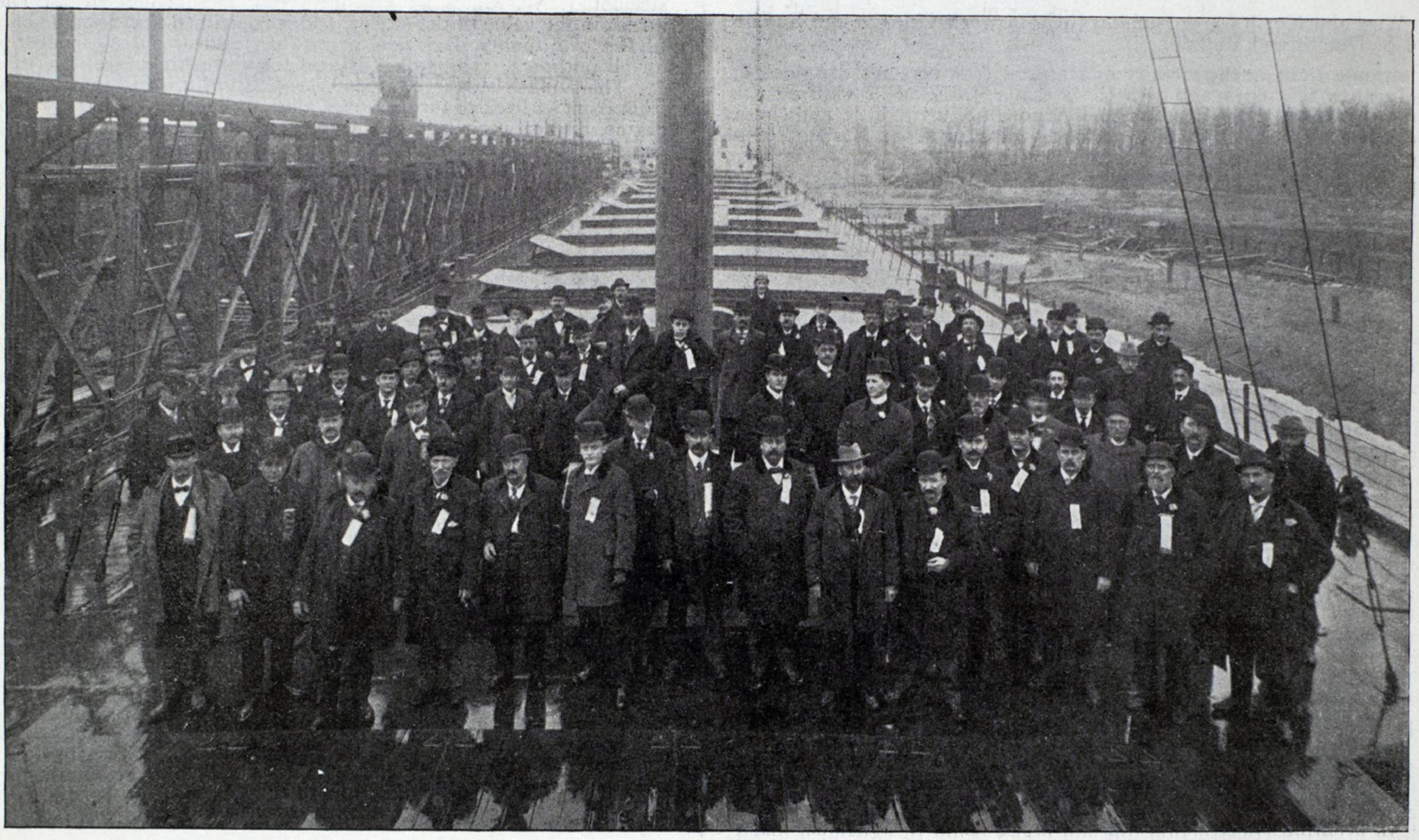
In a general collection of steam specialties the W. M. Pattison Supply Co. of Cleveland included displays of valves, etc., from the Lunkenheimer company of Cincinnati; asbestos material from the H. W. Johns company, New York; rubber goods from the Revere Rubber Co. of Chelsea, Mass.; injectors of the kind made by the Penberthy Injector Co. of Detroit, and stocks and dies made by the Hart Mnfg. Co. The Pattison company are agents for a blow-off valve that attracted much attention at the convention. It is what is known as Cadman's indestructible blow-off valve. Valve and seat are both reversible. It has the approval of the United States board of supervising inspectors of steam vessels and is made by the A. W. Cadman Mnfg. Co. of 63 Water street, Pittsburg. The Crane Co. of Chicago, well-known manufacturers of valves and other specialties, had a very large display of their manufactures in a parlor adjoining that of the Pattison Supply Co.

One of the specialties shown in connection with the exhibit of the Strong, Carlisle & Hammond Co.'s exhibit was the Squires' automatic feed water controller, made by Charles E. Squires of No. 74 Frankfort street, Cleveland. This feed water controller is in use on a number of the modern lake freight steamers, and is said by several of the prominent engineers to be almost indispensible where water tube boilers and quadruple expansion engines of high power are used, as is the case with nearly all of the steamers now building for lake freight service. Mr. Silas Hunter, engineer of one of the Pittsburg Steamship Co.'s vessels, is assisting the manufacturers in introducing this device.

Messrs. M. C. Baker and Wm. Morrison were looking after the pump exhibit of Henry R. Worthington, the Geo. F. Blake Mnfg. Co., Laidlaw-Dunn-Gordon Co. and other concerns connected with the pump consolidation. They had a room full of models, several of them of the kind that were shown at the Paris exposition. The display was very interesting, as several of the miniature pumps, representing the highest practice in this line of engineering, were operated by air from a small hand pump.

Mr. J. M. Chapman of Chicago, who represents the Garlock Packing Co. in the lake district, was assisted in directing attention to a display of the Garlock company's packings by Edward A. Smith and S. R. Amedon, city sales agents of Cleveland, and also by C. W. Scott, another of the Garlock company's sales agents.

Some of the steam specialties of the Fairbanks Co. that are especially adapted to marine service were also on exhibition. Among other concerns represented were the Peerless Rubber Mnfg. Co. of New York; the Snider-Hughes Co., manufacturers of pumps, Cleveland; Jenkins Bros. of No. 71 John street, New York, by Charles W. Martin, Jr., who is an honorary member of the association of engineers, and Charles J. Jackson, who represents the company in New York state and Ohio; the Ashton Valve Co. of Boston, by Columbus Dill, who knows almost everybody at gatherings of this kind, and the Atlas Pipe Wrench Co. of No. 121 Liberty street, New York, by John E. O'Brien.



DELEGATES TO NATIONAL CONVENTION OF MARINE ENGINEERS, JUST CLOSED IN CLEVELAND.

Photograph taken aboard a modern lake freight steamer, one of the Carnegie fleet, at the Lorain ship yard of the American Ship Building Co. Delegates are facing after house containing engines and boilers, Another hatch is located between position occupied by delegates and the engine compartment.

PHOTOGRAPH BY J. E. McGUE OF CLEVELAND.

### THAT RUMORED SHIP YARD CONSOLIDATION.

The New York Commercial publishes the following: "There is no longer any doubt that strong efforts are making toward a consolidation of ship building companies which have reason to fear the advantages likely to accrue to the lately accomplished Cramps, Vickers & Maxim combination. The inspiration of this new combine is said to have been primarily self-protection, and although the promoters thereof are not willing to discuss the project, owing to its not yet having assumed more than a tentative proposition, it is intimated that there is no design to advance prices on government work. Charles R. Flint, who is understood to be the creative spirit of the venture, says that 'the undertaking has not reached the talkable stage, and no announcement can be made at this time.' Such a project has been more or less currently discussed in ship building circles for several months, and the amount of capital involved has been estimated at $60,000,000. The properties supposed to be concerned in the scheme are the Union Iron Works of San Francisco; the American Steamship Co., the Newport News Ship Building & Dry Dock Co., the Harlan & Hollingsworth Co., the Wm. R. Trigg Co. of Richmond, Va.; the Eastern Ship Building Co. of New London, Ct.; the Bath Iron Works of Bath, Me., and the New York Ship Building Co. of Camden, N. J. The interests of Charles R. Flint are represented in the American Steamship Co. Representatives of these various concerns have been in conference, and informally have discussed the proposed consolidation. While no agreement was reached, certain suggestions, upon which future negotiations will be based, are said to have found common favor."

### UNITED FRUIT CO.'S STEAMERS.

John C. Freeman, consul to Copenhagen, writes to the state department as follows: Seven new steamers have just been ordered for the fruit trade between the West India islands and the United States. The contract for one of them—the Taunton—with the option of two others, was signed recently between the United Fruit Co. and Messrs. Burmeister & Hains, extensive ship builders of Copenhagen. Three of the seven will be built in England, three in Norway, and one in Denmark, with a possibility of two more at Copenhagen. The United Fruit Co. has already over twenty steamers in the banana trade from the West Indies to American ports. These vessels are registered as Norwegian, but it is understood that the bulk of the capital invested is American. This company is also adding to its fleet two steel steamers that are being built at Toledo on the great lakes. They will be owned by an American company and chartered to the fruit company. The Taunton, which may be taken as a typical steamer of the banana fleet, will be a spar deck vessel 227 ft. long, 32 ft. beam, with a depth of 23 ft. She will have a registry of 2,000 tons net, although her usual load will be about 1,000 tons. With this load she will draw 14 ft. of water, and her engines will give her a speed of 13 knots an hour. Besides her cargo she will have accommodations for thirty passengers. Burmeister & Hains have contracted to deliver the vessel complete for 4,000 kroner ($107,200.)

## AROUND THE GREAT LAKES.

At a meeting of the directors of the Cleveland & Buffalo Transit Co. this week a quarterly dividend of 1¼ per cent., payable Feb. 1, was declared.

The steamer Meteor of Canadian canal dimensions, building for Messrs. Hawgood of Cleveland, was launched at the yard of the Craig Ship Building Co. at Toledo, Wednesday afternoon.

Capt. Charles Ross, late of the steamer Alice Stafford, will next season command the steamer Hennepin, which is to take the place of the Stafford on the route between Gladstone and Owen Sound.

The keel for the large car ferry for the Pere Marquette Railway Co., to be finished for the opening of navigation in 1902, was laid at the Globe yard of the American Ship Building Co. in Cleveland a few days ago.

Capt. William Parsons Robinson died at Milwaukee last Sunday at the age of sixty-two years. During his sailing experience he owned interests in and commanded the schooners Dreadnaught and Ethel. He was born at Thomaston, Me.

Companies which held fire risks on the burned steamer City of Louisville are said to have paid over to the Graham & Morton Transportation Co. the sum of $40,000 and taken possession of the wreck. The hull will be floated and with its machinery sold to the highest bidder. The Graham & Morton Co. is still searching for a steamer to take the Louisville's place.

One of the New York papers claims to have learned that at a conference held in that city a few days ago it was decided to next season change the route of the big passenger steamers of the Northern line, North West and North Land, running them between Chicago and Buffalo instead of Duluth and Buffalo.

A strange sight in the vicinity of Dunford & Alverson's dry dock at Port Huron a few days ago was the steamer J. E. Mills shifting the steamers Business, A. L. Hopkins and Argonaut; just a little midwinter towing. The Mills had an odd experience going up from Marysville, as the river was running full of ice.

The Licensed Tugmen's Protective Association at their annual meeting in Buffalo elected the following officers: Grand president, Michael Ryan, Duluth; first vice president, Capt. Harry Coulter, Cleveland; second vice president, Capt. T. V. O'Connor, Buffalo; third vice president, Capt. Caspar Bartley, Escanaba; grand secretary, E. E. Hand, Conneaut; treasurer, G. C. Kendig, Erie.

A large steel freight steamer that is to be controlled in the office of Hutchinson & Co., Cleveland, will be launched at the Globe yard of the American Ship Building Co. Saturday, Feb. 9, and will be named John T. Hutchinson, in honor of the well-known even-tempered and happy vessel owner of that name. The new vessel will be sailed by Capt. John Smith, formerly of the Brazil.

Masters of the Lehigh Valley line vessels just appointed for the coming season are Mauch Chunk, P. McCarlane; Wilkesbarre, D. Driscoll; Tuscarora, William Williams; Saranac, Charles Potter; Seneca, J. Whiteside; E. P. Wilbur, Charles Fuller. The engineers have not been named. The Wilkesbarre was launched last summer, but the Mauch Chunk probably will not leave the ways before the opening of navigation.

Capt. Charles A. Miner, a well known lake master, died at his home, No. 107 Birch street, Cleveland, this week. He fell into the hold of the steamer H. J. Johnson at Ashtabula last winter and never recovered from injuries received at the time. He was compelled to leave his boat at Duluth on the last trip of the season. Capt. Miner was forty-seven years old and had sailed the Queen of the West, George Presley and H. J. Johnson.

The Buffalo Elevating Co. has awarded contracts for the construction of an elevator to replace the Dakota, which was burned in August last. The structure is to be at least 50 per cent. larger than the burned Dakota. It will be 75 by 275 ft. in size, whereas the Dakota was only about 100 ft. square, and its capacity will be 1,250,000 bushels. It will be 170 ft. in height, of fireproof construction, the bin floors being of expanded metal, the ground floor of granolite and the other floors of steel. There will be two movable marine towers, two canal legs and four in stores and four out stores. The operating power will be electricity, about 1,000 H.P. being required. The bins are to be of steel and circular construction. Ten tracks will be laid to facilitate the loading of cars. The new elevator will be ready for business by the middle of May. The site chosen is on the city ship-canal at the Peck slip, one of the best locations in the harbor.

## TWO VERY LARGE SIDE-WHEEL STEAMERS.

The Detroit Ship Building Co., one of the consolidated concerns of the great lakes, has a contract, signed on Saturday last, for the two very large side-wheel steel steamers that are to inaugurate a regular service between Detroit and Buffalo in the spring of 1902. This line has been talked of for some time past. It is now a reality. Mr. McVittie of the Detroit Ship Building Co. is the leading spirit in the enterprise. The ships are to be designed by Frank E. Kirby, and it is said they will cost about $650,000 each. They will surpass anything of a side-wheel steamer kind on the lakes. The new line will be controlled by stockholders of the Detroit & Cleveland Navigation Co. and the Cleveland & Buffalo Transit Co., which are already operating large side-wheel steamers on Lake Erie. It is understood that stockholders of the Detroit & Cleveland company will take one-third of the stock of the new company and that a like amount will be taken by stockholders of the Cleveland & Buffalo company, while the other third will be placed by Mr. McVittie. In Detroit the new line will use the Detroit & Cleveland company's terminal facilities, bearing one-third of the shore expenses of both companies, while in Buffalo the terminals of the Cleveland & Buffalo company will be used and the shore expenses divided equally. At Detroit the D. & C. Co. will derive special advantage from the new line as a feeder for its Lake Huron division. Dimensions of the steamers have not been fully determined as yet. They will be about 20 per cent. larger in hull and machinery than the Cleveland & Buffalo company's steamer City of Erie. They will have inclined, three-cylinder, compound engines, and eight boilers fitted with Howden system of draft. The run from Detroit to Buffalo is 256 miles and it is said that the steamers will be scheduled to make the trip in 12 hours, which is at the rate of about 21 miles an hour.

## THE DULUTH STOKER.

Mr. A. B. Wolvin of Duluth, recently elected president of the Lake Carriers' Association, and under whose direction some twenty or more of the finest steamers on the great lakes have been built within the past four or five years, is very progressive, and has in several instances been first to take up appliances that have proven highly beneficial in the operation of modern freighters. He was first to adopt quadruple expansion engines and water tube boilers for freight steamers, and in this regard some of his vessels have represented the highest practice known to ship building throughout the world. He was first to build lake freight steamers of 500 ft. length and 8,000 net tons capacity. The steamers J. J. Hill, J. W. Gates, I. L. Elwood and Wm. Edenborn of the 500-ft. type, now owned by the American Steel & Wire Co., but still managed by Mr. Wolvin, were built under his direction.

Some time ago Mr. Wolvin undertook the task of developing a mechanical stoker that would be suited to use aboard ship. He caused trials to be made of two or three kinds of stokers well known to steam users and which are to be found in successful operation in great numbers of steam plants ashore. As far as can be learned, none of these stokers were found equal to the requirements aboard ship. On the four 500-ft. ships above referred to there was tried last season a stoker manufactured by the Duluth Stoker Co. of Duluth, Minn., of which Mr. Wolvin is president and W. O. Root manager. This stoker is said to have worked very successfully, so much so that it is to be applied to four other large steel freighters now under construction at yards of the American Ship Building Co. for the Peavey Steamship Co. of Duluth. In the case of the steamer J. W. Gates an elaborate test was conducted last season to ascertain the value of the stoker, and it is claimed that results showed only 1.5 lbs. of ordinary slack coal burned per indicated horse power per hour for all purposes. The stoker is said to produce no smoke.

The Duluth stoker consists essentially of a set of grate bars carried from front to back of furnace over a number of fair leaders by two endless chains, one on each side of the furnace. At the back of the furnace the chains and bars pass over a drum and thence back over fair leaders to the front of the furnace again. At the front of the furnace the chains pass over sprockets, from which they receive motion. The bars each have two wrought iron lugs on lower edge, which hook into the chain, alternate bars hooking in from opposite sides. The upper faces of the bars are toothed and lock into each other, leaving sufficient opening to form air spaces for burning the coal.

From this construction it is evident that a bar can only be removed and replaced when it is passing over the sprocket wheel in the front of the furnace, for at no other time will the teeth be entirely disengaged from each other. The sprockets at the front of the furnace, which give motion to the chains and bars, may be driven by any suitable device, but as the motion is very slow, worm gearing is best adapted for this purpose, the worm gear being driven by a small oscillating engine, immediately above the box containing the gearing, thus making a very compact and simple arrangement. At the front of the furnace also a hopper extends the whole width, into which the coal is shoveled. On the boiler front, and forming the back of the hopper, is a distributing and regulating plate, which extends across the full width of the grate, and is carried above it to whatever thickness is desired to carry the fire. At the front of the furnace, and extending back about one-third the length of the furnace, is a brick arch, and at the back there is an apron plate through which are a number of openings to allow a supply of air to enter over the fire. The speed of the bars from front to back is so regulated that coal shall be entirely consumed in the passage, and the speed will, of course, vary with the draft and thickness of fire carried. The ashes and clinkers are dumped into an ash pan at the back end of the furnace.

While it is the intention of the Duluth company to pay especial attention to applying these stokers to steam vessels, it is claimed that they are equally well adapted to stationary plants, and have been so applied in a number of instances where ability to make steam without producing smoke was of special importance and value.

## PROVIDENCE WINDLASSES.

In the Marine Record of Dec. 20, 1900, there was published a list of orders received by the American Ship Windlass Co., Providence, R. I., the past year, for vessels on the great lakes. Since this list was published the American Ship Windlass Co. has received the following additional orders for Lake vessels:

Steamer building by Jenks Ship Building Co., Port Huron, Mich., No. 8 steam capstan windlass.

Hull No. 49, building by Chicago Ship Building Co., No. 8 steam capstan windlass; No. F steam capstan.

Hull No. 50, building by Chicago Ship Building Co., No. 8 steam capstan windlass; No. F steam capstan.

Hull No. 100, building by Buffalo Dry Dock Co., No. 7 steam capstan windlass.

Hull No. 142, building by Detroit Ship Building Co., No. 8 steam capstan windlass; No. F steam capstan.

Hull No. 143, building by Detroit Ship Building Co., No. 8 steam capstan windlass; No. F steam capstan.

Hull No. 309, building by American Ship Building Co., Lorain, O., No. 8 steam capstan windlass; No. F steam capstan.

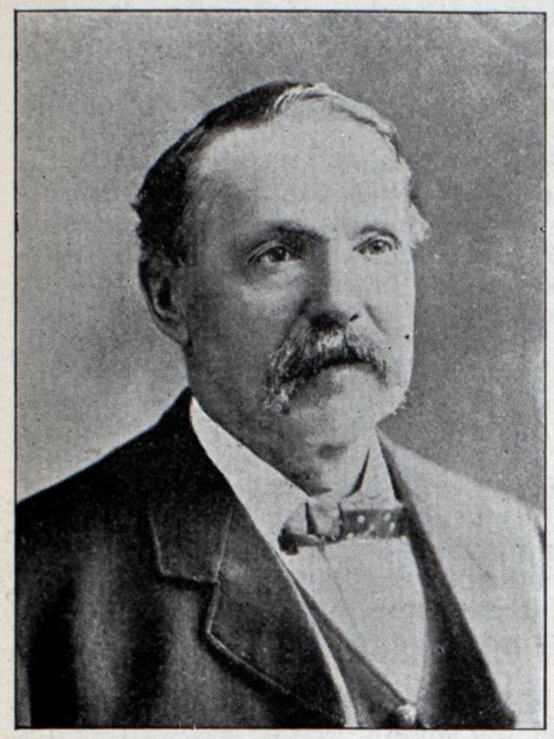
Hull No. 310, building by American Ship Building Co., Lorain, O., No. 8 steam capstan windlass; No. F steam capstan.

The American Ship Windlass Co. has also received an order for a No. 8 steam capstan windlass and a No. E steam capstan for a steamship building by the Collingwood Ship Building Co. of Collingwood, Ont. It would seem as though the merits of this windlass were well understood by the ship building and ship owning public of the lakes, as nearly all of the ships built on the lakes last year had this windlass, and it is said to have advantages which no other windlass built anywhere in the world possesses.

This company builds also the Shaw & Spiegle towing machine, which has been applied to all the large towing vessels built on the lakes in recent years, some of them up to 8,000 tons capacity, and which is also in use in different parts of the world.

### SKETCH OF THE LATE CAPT. RICHARD BARROW.

Capt. Richard Barrow, a brief mention of whose death was made in the last issue of the Review, while he had not been associated with vessel interests during the past fifteen years, had had a long and varied career along the great lakes. He was born in London on New Year's day, 1823, and came to this country with his parents in 1832, settling in Cleveland about a year later. Cleveland at that time had scarcely reached the dignity of a village. Barrow's parents lived in a log cabin, which occupied the site of the present Society for Savings building. Erie street marked the limits of the village and all beyond was woods. In the spring of 1837 he, with his father, purchased the sloop Wave of seven tons for $110 and started for Thunder bay to trade with the Indians and fishermen. For two years they traded up and down the east and west shores of Lake Huron, bartering with the Indians. At that time Levi Johnson of Cleveland was building the light-house at the mouth of Saginaw river. It was at this time that young Barrow had a most thrilling experience. He had just loaded the vessel with fish, fur and cranberries at Saginaw when his father was taken violently ill. Being twenty miles from any doctor Barrow hove up the anchor and started down the lake alone. He sailed the schooner unaided to Port Huron and put his father in the hospital there.



In 1842 Barrow, the elder, opened up the route between Cleveland and Port Stanley with the schooner Friendship of 14 tons. This constituted the first regular service between the two towns. This packet was later sold and a larger one called the Emma placed on the route. In 1849 the schooner Mary was secured and placed on the route, but was sold in 1852. In the fall of 1852 the side-wheel steamer Telegraph of 181 tons was purchased by the father and young Barrow became the captain of it. The Telegraph collided with the schooner Marquette in 1858 and was sunk in twenty minutes. No lives were lost. In the winter of 1859 young Barrow built the schooner Union and sailed her until 1864. This ended the sailing to Port Stanley, which covered a period of twenty-two years, Mr. Barrow having the distinction of having crossed the lake oftener than any other man. In the fall of 1866 he built the schooner Conrad Reid and sailed her for six years. Later he shipped as mate on the schooner Narragansett and upon this vessel encountered the most exciting experience of his life. In a terrific storm on Lake Huron the schooner lost nearly all her canvas and was unable to make any headway whatever against the storm. Barrow was struck by the main boom and knocked overboard. The vessel had listed badly and Barrow was enabled to grasp the railing, which was nearly on a level with the water when he rose to the surface—a thing which, of course, he would not have been able to do had the vessel been making any headway. The deck load of iron ore was washed overboard and the vessel was altogether a greatly disfigured object. The Narragansett was one of the first vessels to cross the ocean, seeking salt water whenever things were dull on the lakes. Mr. Barrow was also on the steam barges Sparta and Sumatra, but latterly had not been sailing. He leaves three sons—Richard, William H. and Arthur J.

### SOME INTERESTING IRON ORE FIGURES.

Mr. H. L. Holden, dock agent of the Duluth & Iron Range Railroad at Two Harbors, Minn., who was in Cleveland a few days ago, had prepared in elaborate type-written form some very interesting tables dealing with all manner of details regarding the 4,007,294 gross tons of iron ore transferred from railway cars to vessels during the past season at Two Harbors. The total number of cargoes was 960 and the number of vessels 181. One table showed the number of cargoes taken by each of the 181 vessels, the tons loaded each trip, destination of the vessel and the total number of tons carried by each vessel during the season, as well as the average load, draught of the vessel each trip, and the average draughts. The steamer Wm. Edenborn, one of the Wolvin 500-footers, loaded the largest cargo of the season—7,446 gross or 8,340 net tons. The average cargo for all the vessels was 4,178 gross tons. The average time of loading for all the 960 cargoes was 7 hours. The average draught of ships was 16-ft. 11 in. and the maximum draught 18 ft. ½ in. One vessel, making a trip in midsummer, loaded to 18 ft. 2 in., but was said to have met with difficulty at the Sault canal.

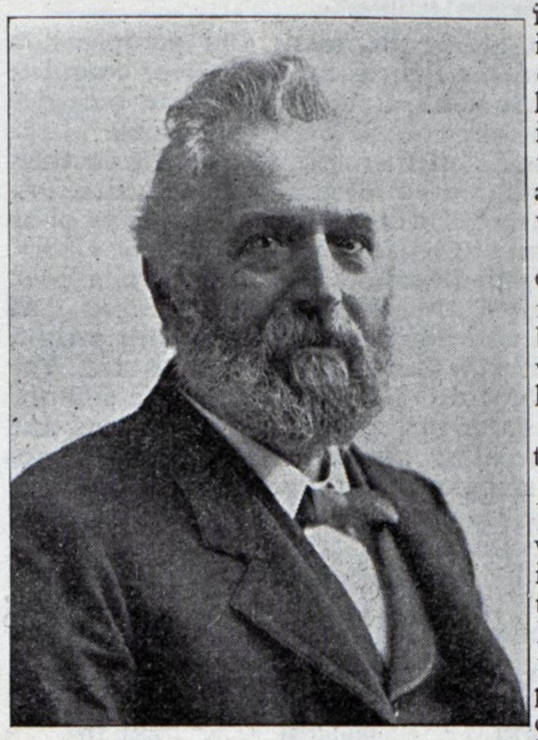
The steel steamer Mataafa and barge Madira of the Minnesota Steamship Co.'s fleet distinguished themselves in the Two Harbors trade last season. They each moved nineteen cargoes of ore. The steamer's total of ore moved was 120,904 tons, and that of the barge 133,457 tons, so that together they moved 254,361 tons.

### BUYING UP THE WOODEN SHIPS OF THE LAKES.

During the present week Mr. J. C. Gilchrist of Cleveland has added seven more vessels to his fleet—six steamers and a schooner. Five steamers and the schooner represent the wooden fleet of the Wilson Transit Co., upon which Mr. Gilchrist has had an option for the past thirty days. The vessels are the Wallula, Olympia, Sitka, C. Tower and Yakima and the schooner Yukon. The purchase price was $300,000 cash. The Wallula, built in 1883, is the oldest and the Yukon, built in 1893, is the youngest. The purchase price is considered reasonable. The seventh vessel purchased by Mr. Gilchrist is the steamer Charles A. Eddy, which was bought from Capt. Boutelle of Bay City for $70,000. The Eddy was built in 1889. With the eight steel steamers building, Mr. Gilchrist controls a fleet of forty-two vessels that are capable of carrying in a season about 2,500,000 tons of freight.

### DEATH OF COM. WILLIAM H. WOLF.

Death has claimed another man who had been identified with the lake interests since the early fifties, in the person of Com. William H. Wolf, who died at Milwaukee last Monday as the result of a surgical operation. Mr. Wolf had been in ill health for a long time, and some time ago suffered a slight injury which developed into blood poison and threatened the infection of the whole system. It became necessary to amputate one of his legs, and the claim upon his vitality thereby was so great that he was unable to meet it. He died at the age of seventy-two years. Mr. Wolf was a native of Germany. He went to Milwaukee in 1849, but traveled extensively throughout the country for a few years, so that he did not become a permanent resident of Milwaukee until 1853. During that year he entered the ship yard of J. M. Jones as foreman. In 1858 he entered into partnership with Theodore Lawrence, under the firm name of Wolf & Lawrence. In 1863 this firm was succeeded by Ellsworth & Davidson. During the years from 1863 to 1868 Mr. Wolf located at Fort Howard, where he built the side-wheeler George L. Dunlap, which plied between Green Bay and Escanaba before the construction of the Northwestern railroad. In 1868 the ship builder returned to Milwaukee, buying out Mr. Ellsworth in his old firm, when the name changed to Wolf & Davidson. This firm for many years conducted an extensive ship building and dry dock business. It was the largest ship yard in that section of the country. Among the large lake craft which were built under Com. Wolf's supervision were the side-wheel steamer Flora, the screw steamers James Sheriffs, Business, George H. Dyer (now the Hennepin), Minnesota, Progress, R. P. Flower, W. H. Wolf, Thomas Davidson, Fred Pabst and Ferdinand Schlesinger. The last named steamer came out in 1891 and the Pabst in 1890. At the time of his death Com. Wolf owned the steamers W. H. Wolf and Fred Pabst and the tow barge Armenia, the last named vessel having been bought a year ago from Capt. James Davidson, the West Bay City builder. The firm also built many schooners, tugs and scows and did a general repair business. Wolf was for many years a prominent member of the Masonic fraternity, and at the time of his death was a member of Independence lodge, No. 80; Excelsior chapter, No. 40; Wisconsin commandery, No. 1, Knights Templar, and Wisconsin consistory. Com. Wolf is survived by his wife and three daughters, Mrs. Charles J. Dyer, Mrs. Frank Becher and Mrs. Marian Pingree, the latter residing at the Wolf home.



At 11 o'clock Monday morning, less than eight hours after Com. Wolf passed away, his brother, Peter R. Wolf, died at Milwaukee. He had been ill for a long time with cancer of the stomach. Peter R. Wolf was sixty-four years of age.

### ENGINEERS' CLASSIFICATION OF STEAMERS.

The executive committee of the Lake Carriers' Association will meet in the office of James Corrigan, Cleveland, on Friday afternoon. Several matters of interest, including the proposed benefit fund, will come before the meeting. The executive committee has received from the Marine Engineers' Beneficial Association a copy of a classification of steamers with schedule of wages as suggested by the engineers since their annual meeting. What will be done by either vessel owners or engineers regarding the classification remains to be seen. The vessels are placed in three classes and the wages for chief engineers range from $105 to $132 per month. Following is the classification:

First class—All steel steamers of more than 1,800 tons; all passenger steamers of more than 750 tons.

Second class—All steel steamers less than 1,800 tons and more than 500 tons, and all wooden steamers of more than 500 tons; all passenger steamers of more than 200 tons and less than 750 tons.

Third class—All steamers not included in first class or second class, including tugs and canalboats. All reference to tonnage to be understood as meaning gross tons.

Crew—All first class steamers having water tube boilers and more than two boilers to carry three engineers and two oilers, and water tenders where required.

All second class steamers of more than 1,500 tons, having water bottoms or auxiliary machinery, such as electric lights, hoisting engines, etc., to carry two engineers and two oilers.

All second class steamers of more than 1,200 tons, and not included in the above, to carry two engineers and one oiler.

Following is the schedule of wages:

First class—Chief engineer, per month, $132; first assistant engineer, per month, $96; second assistant engineer, per month, $84.

Second class—Chief engineer, per month, $114; assistant engineer, per month, $84.

Third class—Chief engineer, per month, $105; assistant engineer, per month, $75.

Wages for fish tugs—Large tugs $105; small tugs $90.

Robert A. C. Smith and David C. Reid, ship owners of New York, associated with Sir William Van Horne and Charles R. Hosmer of Montreal and T. G. Fitzgibbon of Toronto, have given notice that they will apply at the coming session of the Canadian parliament for a charter of incorporation for a new company, the title to be the North American Mail & Steamship Co. It is proposed to operate steamships between British and foreign ports and carry on the business of forwarding agents, ship brokers and warehousemen. The capital stock is placed at $175,000, consisting of 1,750 shares at $100 each, and the headquarters of the company will be in Montreal.

## OUTPUT OF SCOTCH SHIP BUILDERS.

IN 1900 IT WAS ABOUT ONE-QUARTER OF THE WORLD'S NEW TONNAGE—INTERESTING SUMMARY OF SHIP BUILDING IN THE UNITED KINGDOM—PROGRESS OF THE INDUSTRY.

From a special correspondent at Glasgow.

Writing early in December last about the work and prospects of Scotch ship builders, I said that when the figures for 1900 were complete it would probably be found that the Scotch output for the year exceeded half a million tons. The returns now are complete (though some of the newspapers were rather "too previous" and therefore inaccurate in their figuring), and they show that the Scotch output of new vessels in the closing year of the nineteenth century was a record one, being 406 ships of an aggregate tonnage of 541,031 and of an aggregate engine power of 478,936 I.H.P. Of this great total the ship builders of the Clyde (Glasgow, Greenoch, Dumbarton, etc.) contributed 318 vessels of 492,609 tons, and 447,428 I.H.P.; the ship builders of the Forth contributed thirty-three vessels of 16,402 tons and 6,490 I.H.P.; the ship builders of the Tay (Aberdeen) fourteen vessels of 21,639 tons and 17,228 I.H.P.; and the ship builders of the Dee (Dundee) forty-one vessels of 8,381 tons and 8,790 I.H.P. No other single ship building center in the world can approach the output of Scotland. In England the Tyne comes out best with 325,277 tons, the Wear with 258,940 tons, the Tees and Hartlepool together with 307,932 tons. But, of course, there are several other building centers in England which bring the aggregate of that portion of the United Kingdom into the forefront. The following little formula shows at a glance the distribution of the industry in the United Kingdom:

SHIP BUILDING OF UNITED KINGDOM IN 1900.

| | No. of vessels. | Tonnage. | I. H. P. |
|---|---|---|---|
| England | 873 | 996,320 | 631,107 |
| Scotland | 406 | 541,031 | 478,936 |
| Ireland | 26 | 137,493 | 67,600 |
| Total | 1,245 | 1,674,844 | 1,177,643 |

As the output of the world in sea-going vessels was probably not more than 2,370,000 tons last year, the United Kingdom furnished one-half and Scotland very nearly one-fourth, of the whole. The largest product of any one firm in Scotland was not that of a builder of crack ocean liners or battleships, but that of Russell & Co. of Port Glasgow, who turned out 60,339 tons of good, honest cargo "tramps" ranging from 1,000 to 4,000 tons each. The second largest, however, was A. Stephen & Sons, with 34,555 tons of "liners." Then came Charles Connell & Co. with 32,316 tons, principally of "liners," and then William Denny & Bros. with 30,600 tons of a mixed assortment of "liners" and passenger boats. Other notable outputs were those of Scott & Co., 29,970 tons; D. & W. Henderson & Co., 28,930 tons; John Brown & Co. (Clydebank), 26,250 tons; William Hamilton & Co., 21,600 tons; Caird & Co., 22,714 tons; the Fairfield Co., 17,765 tons; and Barclay, Curle & Co., 17,650 tons.

After putting into the water all this tonnage in 1900, Scotch ship builders began the new century with orders on their books to the extent of upward of 500,000 tons, of which 450,000 tons was in the hands of builders in the Clyde district. Not many new orders have been booked since the year opened, but it is known that a good many are only being held in suspense until prices settle down. Ship owners seem of the opinion that costs have not yet reached "hard pan," seeing that coal is still coming down and is bound to come still lower within the next month or two, unless labor troubles arise with the miners.

The decline in prices of ship building material, and consequently of ships, has been almost as rapid as the rise. In January of last year steel ship plates were £7 15s. per ton and they rose up to £8 15s. in April; indeed, even higher figures were asked, though probably not paid. In May there was a decline to £8, after which there was a steady descent until the present quotation of £6 15s. was reached. We began the year, therefore, with plates just £1 per ton cheaper than they were a year ago. At the beginning of 1900 the cost of 10-knot boats of about 6,000 tons capacity was about £9 10s. per ton. It rose to £10, came back to £9 10s. and today may be taken at £9, though not, perhaps, for very early delivery. But ship owners seem to think the £9 per ton dead weight is too much to pay for new cargo boats when freights all around are on the down grade. Of course, the regular mail and passenger lines have to consider not so much the prime cost of ships as the necessity of looking ahead to keep their fleets always up to the time of day.

Here it should be explained that the statistics of output we have given do not quite agree either as to number or tonnage with the figures issued by Lloyds' Register. This is partly because Lloyds' returns only include vessels over 100 tons, whereas our figures include all the vessels launched; and partly because of the difference in some cases between builders' measurement and Lloyds' measurement for purposes of registration. It may be further noted that the output in 1900 was practically all in steam tonnage, there being only 0.7 per cent. of the total in sailing tonnage, and it was practically all steel, 99.1 per cent. of the whole number of vessels being built of that material, with only 0.8 per cent. of iron and 0.1 per cent. of wood.

Some of the notable products of the Clyde ship yards last year were the Tunisian, 10,676 tons, built by A. Stephen & Sons for the Allan State line; the Evangeline and Loyalist, each 3,900 tons, built by the same firm for the Furness-Leyland line; the Atinda and Itola, each 5,200 tons, built by Wm. Denny & Bros. for the British India line; the Rimutaka, 7,700 tons, by the same builders for the New Zealand Shipping Co.; the Lyristrata, a steam yacht of 2,000 tons, by the same builders for Mr. J. Gordon Bennett; four boats of 7,000 tons each, built by Scott & Co. for the Ocean Co.; the Shinano Marie, 6,000 tons, built by D. & W. Henderson & Co. for the Japan Steamship Co.; Assyria, 6,350 tons, by the same builders for the Anchor line; the Vaderland and Zeeland, built by John Brown & Co., Clydebank, for the Red Star line; three 7,000 to 8,000-ton boats built for the P. & O. Co. by Caird & Co.; a first-class cruiser and an Indian troopship, built for the government by the Fairfield Co.; the Ikhoona, 2,300 tons, for the British India line, and five steamers of 750 tons each for the Newfoundland trade, built by A. & J. Inglis. But this is only a rapid selection, as we would need several columns to describe all the miscellaneous craft, from battleships to barges, turned out by Clyde ship builders for service in all parts of the world.

It is interesting at the beginning of a new century to note the tremendous development of the ship building industry. In the year 1807 there was practically no ship building at all at Glasgow, for the Clyde then was only a ditch and all the building of vessels for Glasgow merchants engaged in American, Canadian and West Indies trade, and in the Newfoundland and Greenland fisheries, was done at Greenoch. The present firm of Scott & Co. began ship building at Greenoch as far back as 1710, and has retained its firm name to this day. It may be doubted if such expansion and trade record in ship building can be paralleled elsewhere in the world. The demand was then chiefly for vessels for the herring fishery, but by the middle of the eighteenth century Scott & Co. were building stout wooden sailing traders of 500 tons or so for English owners. The next development in ship building was at Port Glasgow, a place just next door (so to speak) to Greenoch, but created by Glasgow merchants as a sea port for their vessels which could not get up and down the then narrow and shallow river; and it was at Port Glasgow that John Wood & Co. built the first steamer that ever churned the waters of the Clyde, to wit, the famous Comet. That was just ninety years ago, and for some years afterward John Wood & Co. did most of the steamer building there was to be done. The next steamship builder was William Denny, who, in 1818, began the business which has developed into the present enormous establishment of William Denny & Bros., Dumbarton. Some twenty years later the famous Robert Napier, one of the founders of the Cunard line, who was an engineer and iron founder, began to build ships and founded the yard now run by William Beardmere & Co., in the neighborhood of Glasgow; and about the same time was founded by Robert Barclay the well-known ship building and engineering firm of Barclay, Curle & Co.

These, of course, were the days of wood and before the publishing of records of annual outputs. By about the middle of the last century the ship builders in the Glasgow district were Robert Napier & Sons, Barclay, Curle & Co., Randolph, Elder & Co. (afterwards John Elder & Co., and now the Fairfield Ship Building & Engineering Co., Ltd.), A. & J. Inglis, Alexander Stephen & Sons, J. & G. Thomson (afterward Clydebank Ship Building & Engineering Co. and now John Brown & Co., Ltd.), and Tod & McGregor. The last named firm is now extinct, but the yard is occupied by D. & W. Henderson & Co., who have built all the Anchor liners, and many a goodly vessel and shapely yacht besides. By about 1860 the output of the Clyde ship yards was not more than 35,000 tons per annum—not as much as half a dozen of the yards can each turn out now with the greatest ease. Within the last forty years, therefore, the Clyde industry has developed more than twelvefold, and it is not unlikely that the Clyde output alone may this year reach 500,000 tons and that of all Scotland 600,000 tons.

It is true that all the yards are not fully booked, though most of them have work on hand to keep them busy until 1902. But the very fact that some of them see slackness ahead is enough to make them bustle around for business and adapt themselves to the ideas of ship owners. The year has begun with a large decline in coal and a considerable slump in pig iron. If last year ship builders were worried by rising prices, which must have tended to make some of their contracts unprofitable, and must have made the year an anxious one for all of them, this year they can preserve easy minds on the subject of material. With coal and pig iron coming down as they are doing, ship building material is bound to become cheaper as the year advances. Bottom dollar will probably be reached within the next six months and in the meantime even the most conservative ship owners will be compelled to replenish their fleets; for not only is there the natural shortage by wreck and superannuation of the past year to be made good, but there is also to be replaced a very large amount of second-hand tonnage sold to foreigners, and there are more naval contracts to be placed. Altogether it is not improbable that British ship builders generally and Scotch ship builders particularly, may have a larger output this year than even last. Up to the present, however, the writer is bound to say there is no appearance yet of a rising wave of orders. Even the contracts for two monster Cunarders of the Saxonia type, which have been in the air for some weeks past, have been indefinitely suspended.

Unsatisfactory, from a financial point of view, as last year was for ship builders, it was worse for iron smelters and iron and steel manufacturers. The latter had for the greater portion of the year costs of crude iron and fuel rising against them whilst the prices of the finished materials were being forced down by American and German competition; and smelters were unable, so they say, to get prices for pig iron high enough to compensate them for dear coal, dear ore and high wages. Even since coal came down to about the level of the end of the year several furnaces have been damped out because of the low prices now obtainable for pig iron. Yet pigs are still not cheap enough to please consumers and there has been no hurry to resume operations in any of the finished iron and steel works since the new year holidays. Indeed, several large makers admit that they intend to remain closed until the end of January, in order by curtailing the consumption, to bring coal down.

Although 1900 began with an unprecedented demand for pig iron, the Scotch smelters during the year put out only 1,153,896 tons, or 12,942 tons less than in 1899. The average yield per furnace dropped from 270 to 265 tons per week, owing to the inferior character of the ore now being imported. The local consumption of Scotch pig iron decreased by 3,672 tons and of all pig iron by 158,672 tons, owing to the depression in the local malleable iron and steel trades. But the exports increased by 19,819 tons and the stocks were reduced by 142,394 tons, the total consumption (home and foreign) being so much in excess of the production. There are now twelve furnaces fewer in blast in Scotland than at the end of December, so the output of pigs in 1901 promises to be considerably less than in 1900.

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Thomas Drein & Son, the boat builders of Wilmington, Del., have lately been awarded the following contracts: Twenty-four 28-ft. patent, beaded, metallic life boats and eighteen sea life rafts for steamers on the Atlantic and Pacific coasts; fifty-eight 22-ft. boats for steamers building on the great lakes; sixteen 24-ft. boats for Gulf of Mexico steamships; two 14-ft. boats for steamer building on the Hudson river; two 16-ft., one 14-ft., one 20-ft. and two 18-ft. boats for New York, Norfolk and Gulf of Mexico tugs.

## DENOUNCES THE SHIPPING BILL.

SENATOR VEST MAKES A BRILLIANT, BITTER AND CAUSTIC SPEECH AGAINST THE MEASURE - DECLARES IT TO BE AN INFAMOUS CONSPIRACY.

One of the most bitter speeches against the shipping bill was delivered in the United States senate a few days ago by Senator Vest of Missouri. Vest is physically much emaciated and has been a great sufferer during the past two years. The mere struggle to surmount a physical limitation added force to the speech and it was in effect one of the most dramatic that has been delivered in the house. For more than two hours he held the senate within the fascination of his wit, his satire, his eloquence, his logic, his phenomenal command of his mother tongue, his vigorous denunciation of all things which to him seemed unrighteous—this little old man with the wasted figure and the thin and piercing voice. He denounced the shipping bill as a conspiracy of the New England shipping interests. He declared that the decline of the merchant marine was due to infamous navigation laws which refused an American citizen the right to buy ships where he could buy them cheapest and then sail them under the flag of his country.

"These navigation laws are a relic of barbarism, yea, worse," exclaimed the senator from Missouri, "because they came from an infamous coalition between the shipping interests of New England and the African slave trade. In the constitutional convention of 1787 there were pending two provisions, one to require a two-thirds vote of each house to enact navigation laws, the other to extend the African slave trade to 1800. They were referred to a committee, and that committee reported in favor of striking out the clause requiring a two-thirds vote in each house to enact navigation laws and extending the African slave trade till 1808. The people of New England were anxious for navigation laws because they had just commenced constructing those fast clipper ships and the business was exceedingly profitable. The southern states, Georgia and the two Carolinas, were anxious to extend the African slave trade because the culture of cotton was becoming more profitable and they wanted more negro labor. New England had sold her negroes to the south, but there were not enough of them. When the report was made to the convention John Pinckney of South Carolina moved an amendment extending the slave trade to 1808, and Gorham of Massachusetts seconded it. Madison and Mason of old Virginia vehemently denounced the proposition, declaring that it was an insult to the humanity and intelligence of the American people, and a vote was taken, each state casting one vote. All the New England states, with New York, Maryland, Georgia, North and South Carolina voted in the affirmative, while Virginia, Pennsylvania, Delaware and New Jersey voted in the negative. Hand-in-hand Massachusetts and North Carolina marched at the head of the procession, carrying in one hand the ship building interests of New England and in the other the African slave trade. The south has paid a terrible penalty for that infamous conspiracy. She paid for it in 1861 with tears and ashes and blood. Today her social system is deranged and her industrial system destroyed, and the man is a bold one who can prophesy what will be the result in the future. But New England is rich and powerful; New Englanders have made money in every contingency and in every era in the history of our country. First they drove back the Indians, took their lands and sold many of their chiefs into slavery in the West Indies. Then they pursued with great profit the African slave trade, and finally, in a war waged against the people to whom they had sold their negroes after they had found them unprofitable, they had government contracts which filled every savings bank in New England, until now they are the most powerful and richest relatively of all the sections of this country.

DENOUNCES NEW ENGLAND FROM THE DAYS OF PLYMOUTH ROCK.

"I am not attacking the people of New England; I admire them. I admire their courage, their sagacity, their aggressiveness. With a sterile soil and an inhospitable climate, they control the politics and the policy of the United States. They send their ablest men to both branches of congress, and they keep them there as long as they can preserve the material interests of that section. It makes no difference how these representatives and senators may differ with the people as to matters of sentiment and abstraction. If they are true to the material interests of New England that is enough. The two senators from Maine differ as widely as the north and the south pole upon the foreign policy of the United States, but they are put here today by the ultimatum vote of the legislature of Maine. The two senators from Massachusetts are equally diverse in their opinion as to the Philippine question and the Philippine war, but the people of Massachusetts send them both here because they know their ability and recognize their usefulness. I hope I may be pardoned for quoting what a very eminent son of Massachusetts once said, that 'when the pilgrim fathers landed on Plymouth rock they fell on their knees, then fell on the aborigines.'

"New England is properly named," Senator Vest continued. "Old England, the little island upon the fogs and mists of the northern oceans, controls the literature and finance and commerce of the world. New England, six small states, a majority of them not as large as counties in Missouri, control the politics of the whole United States. There is no measure here before the senate or the other branch of congress in which New England does not receive the largest share of the government bounty. Take this bill and you will see between the lines that it is a New England bill. Its chief sponsor is my friend the junior senator from Maine (Mr. Frye), who has given his life to the cause of navigation laws and is opposed to free ships. The navigation laws are today as dear to the people of New England as when they wanted a monopoly of constructing ships. This bill was drawn by the most astute New England lawyer in existence, ex-Senator Edmunds, and his handicraft can be seen in every sentence and line of it. It is no surprise that my friend from Maine so vehemently advocates this bill, because it is in entire cognizance with his opinion in regard to the taxation system of the United States. In a speech delivered some years ago before the Home Market Club in Boston that distinguished senator declared that if he had the power he would not allow another pound of English goods to come into this country to compete with the product of American manufacturers, and I have no doubt today that but for the profit of the export trade he and the majority of his colleagues would favor the plan of Henry Clay, the father of protection, who declared that if he could he would have made the Atlantic ocean an ocean of fire over which no foreign ship could pass.

THE BILL IS THE ESSENCE OF EXCLUSION.

"This bill breathes the essence of exclusion. The principle upon which it is based is so obnoxious to the civilization of the world that even China has abandoned it, but we adhere to it, and the people of the United States are asked now to give up their tax money to the enormous amount of $180,000,000 in twenty years in order to maintain this exclusive principle. When England began capturing the carrying trade of the world with iron steamships some people in this country thought it time to repeal the navigation laws so citizens of the United States might buy ships abroad and sail them. Instead of repealing these infamous navigation laws, a nightmare on the merchant marine of the country, New England was able, by her political influence, to retain them upon the statute books, where they are today; and the result was that our merchant marine commenced in 1855 to decline until it has gone down, wasted like a patient with lung disease, until it can hardly be said now to exist at all. Germany, under the leadership of that great statesman, Bismarck, by far the greatest man in a hundred years this world has seen, finding that Great Britain was manufacturing these iron ships and that the merchant marine of Germany was disappearing from the ocean, immediately permitted her people to go to the Clyde and purchase their ships. Eight fleet iron ships were constructed in the yards of Armstrong and brought back to Germany and put under the German flag and the largest steamship in the German merchant marine today, the Oder, was built in Stockholm by German citizens and brought back and put under the German flag. The result was that the ship yards of Germany commenced to thrive under the repairs necessary to these ships bought abroad, and during the last two years Germany has sold over forty war ships to foreign powers and is now competing successfully through her ship yards with those of the British Empire.

"We are told dramatically by the senator from Maine and by the senator from Ohio that the commerce of this country would be absolutely destroyed in the event of a naval war between two European powers; that, having no ships of our own, our exports would cease, our factories would close, our mines would be hermetically sealed and the agricultural products of this country would rot in the warehouses. The senator from Maine draws a ghastly picture of naval war between Germany and England, and asks what would then become of the interests of the United States in such a contingency. Suppose a naval war should come—a great calamity—between Germany and England, and the United States congress should then repeal the navigation laws and permit our citizens to buy ships where they could buy them cheapest and put them under our flag. Nine-tenths of the merchant marine of England and Germany would be for sale the minute such a war commenced, because with the improved war ships now upon the ocean and being built—steel clad cruisers running 23 knots an hour with heavy guns that cast solid shot and shell from nine to twelve miles—every merchant vessel would hunt its harbor and remain there until peace was declared and be for sale to the highest and best bidder, no matter what the price.

"Repeal the navigation laws in such a contingency and you could buy the merchant marine for one-third what it cost to construct it. We could name our own price. They would be glad to let us have their ships and to see the flag of the United States placed at their mastheads."

## STEAMBOATS ON THE UPPER CONGO.

Twenty years ago Henry M. Stanley, who had reached Stanley Pool to begin his five years' work planting stations on the river, launched the first steamer on the waters of the Pool. It was the little En Avant of five tons burden. In the twenty years that have since elapsed Europe has not failed in a single year to send more steamers to ply on the great African river. There are today 103 steamboats traveling up and down the upper Congo and its tributaries or preparing in the ship yards at Stanley Pool for launching. The flotilla has taken a prominent part in the pacific conquest and the economic expansion of the new Congo country. It has been very prominent in the work of exploration and of occupation. Without these steamers it would not have been possible to start so many trading and other stations. They could not, without the steamers, have procured sufficient supplies. The steamers also made it possible to develop the ivory and rubber trades, which have now reached large proportions. Belgian enterprise has placed nearly half of these vessels on the river. The fleet of the Congo Free State numbers twenty-nine vessels, and Belgian trading companies have nineteen steamers, making a total of forty-eight vessels owned and controlled by Belgian enterprises. The most important fleet after that of the Belgians is the French flotilla. In the past two years the French have sent thirty-nine boats to Brazzaville on Stanley Pool, and most of them have been launched. The Dutch traders own ten vessels, the Germans two and English and American missionary societies have four steamers in their service. It was a gigantic undertaking to transport the first fifty steamers to the upper river. They had to be carried piece by piece on the backs of men. Not a few of the larger vessels were divided into more than a thousand man loads; and after these myriad pieces were unloaded at Stanley Pool months were required to rivet them together and prepare the vessel for launching. So nearly eighteen years were taken in placing the first fifty steamboats on the upper river. A very different chapter in Congo history has been written in the past two years since the opening of the railroad from Matadi to Stanley Pool. Within the past twenty-four months half of the upper Congo fleet of fifty vessels have been carried on the cars to the Pool. While a month was required to carry the earlier boats over the mountains and down into the valleys along the 235 miles between the lower Congo and the Pool, an entire boat is now carried over the route in two days. Thus the railroad has facilitated placing steamers on the upper river; and now both railroad and steam vessels are working together in the commercial expansion of the country.

Light-ship No. 72, built by the Fore River Engine Co., Quincy Point, Mass., for duty on the Diamond shoals, was given her builders' trial trip last week and proved in every way satisfactory. This vessel has the reputation of being the staunchest light-vessel in the world. It is to do duty in the most treacherous bit of water to be found anywhere on the Atlantic coast.

# MARINE REVIEW

**Devoted to the Merchant Marine, the Navy, Ship Building, and Kindred Interests.**

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## To All Old Sailing Masters on the Great Lakes.

**The Marine Review is desirous of obtaining the experiences of old sailing masters on the lakes and the histories of the old vessels which they sailed, together with photographs or pictures of them and their craft. These old sailing masters and their vessels are a part of the history of the great lakes which is fast becoming obliterated by the revolution in lake transportation. This history is of a perishable nature because it exists largely in the memories of men who have spent the greater part of their lives on the lakes. If it is not preserved now it never will be preserved. The Marine Review therefore begs old captains and mates and vessel owners to write a brief account of their lives, their experiences on the lakes and the histories of the vessels upon which they sailed. The Review will both publish and pay for the matter. Never mind spelling, punctuation and diction; the Review will furnish those; just relate the facts. The Review hopes that every old sailing master will take this as an appeal to him personally and jot down during his winter evenings a rough sketch of his life. For instance, but little is known about Lake Superior navigation prior to the opening of the Sault Ste. Marie canal. Who knows about it? Has anyone any pictures of the vessels afloat on Lake Superior at that time. If so, send them to the Review to be photographed and they will be promptly returned in good condition. By the same token, does anyone know of the first steamboat line that ran between Detroit and the Sault?**

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While one week ago it was impossible to see a clear passageway through the parliamentary and legislative tangle for the shipping bill, the labyrinth today presents a somewhat easier path. Evidently Senators Frye and Hanna stood upon a slight elevation and were enabled to see a greater distance than their neighbors. They seem, indeed, to have cause for the faith that was in them, for as things look now, the bill is almost sure to pass the senate, and it is extremely likely that it will pass the house. There are votes enough to pass it in both places. The determined opposition of the minority has not developed; neither have the filibustering tactics of the Populists been resorted to. A great many members who were indifferent to the bill have been brought into line. These indifferent senators were those who could see no good in the bill to the states which they represented and who held that money was being taken out of the treasury to benefit a few coast cities. It has been demonstrated to the senators of the interior states that the farmers will reap a great benefit through the decreased freight rates on agricultural products. Indeed, a monograph upon this subject has been prepared by the secretary of agriculture and scattered broadcast throughout the west. Senator Hanna has leaped into the periodicals and magazines, both at home and abroad, and has achieved a reputation as a literary prodigy second only to his fame as a political captain. The English journals cheerfully accord to him first place as an exponent of the bill, praise him for the lucidity of his arguments and thank him for not repeating the "historic lie that England subsidizes her ships." The result has been that all the indifferent senators have been won over and will vote to keep the bill before the senate and to vote for it when it is presented for passage. The sponsors of the bill have been equally successful with another class of senators—those who were unwilling to accept the commerce committee's draft of the bill and who had bills of their own. Their pacification has come about through the acceptance, on the part of the managers of the bill, of a series of amendments drafted by Senator McMillan of Michigan, which are said to represent not only his personal views but those of Senators Allison, Aldrich, Burrows, Spooner, Nelson and others. Senator Frye has given out the following statement as to the concessions made to the McMillan following:

"No extra compensation to be allowed vessels of over 18 knots, thus cutting off about $50,000 from each of the fast going mail ships as provided under the original terms of the bill.

"No compensation to be allowed oil tank vessels.

"The length of time for which contracts can be made is reduced from twenty to fifteen years.

"The number of foreign vessels to be admitted to American registry, provided a like tonnage is built in the United States, is limited to four vessels to each firm for each class—that is, four vessels already built and four vessels for which contracts have been made and not completed. The effect of this will be to reduce the amount of foreign tonnage that may be admitted to American registry under the terms of the bill from about 350,000 to 200,000.

"A modification of clause F of the bill makes it necessary for any ship owner or builder to actually begin the work of construction before a contract will be entered into."

In addition to these modifications it had been proposed that the compensation be paid in the form of postal subsidies, but Senator Frye held that this was not entirely practical as a postmaster-general who might be opposed to the principle of a subsidy could hold up payment. The senate committee on commerce did not want to accept the tank vessel amendment, but as the house committee has already adopted such an amendment it was adopted for sake of harmony in conference. The amendment reducing the time limit to fifteen years was accepted without opposition. Indeed such an amendment has been expected all along. The reduction in the amount of tonnage that may be admitted to American registry is a concession to the American ship builder.

A careful canvass has been made of the opposition and it develops that it is not formidable. Senator Jones, the Democratic leader, says that he will speak against the bill, but will not endeavor to prevent a vote upon it. Nor does he think that the Democrats will filibuster. Therefore, its course in the senate is comparatively clear, and as the Republicans have the votes, there is no reason why the bill should not pass.

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One of the most invaluable books to iron manufacturers and iron ore interests is the "History of the Manufacture of Iron in All Ages," by James M. Swank, general manager of the American Iron & Steel Association, Philadelphia. It traces the history of iron from its earliest use down to the present time. Iron was first made in Asia and Northern Africa. Mr. Swank pursues its history through various countries and various processes with the utmost research. The work has been done with great fidelity and must have entailed a prodigious amount of labor. When the United States is reached the history is related by states, and much of historical reference can be found that is to be obtained in no other publication. This is particularly true in its relation to the Lake Superior mining region. The work deserves a place in the library of every iron ore concern along the lakes.

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The Scherzer Rolling Lift Bridge Co., Mr. Albert H. Scherzer, president, has just issued a book descriptive of the Scherzer rolling lift bridge. It is bound in blue cloth, appropriately illuminated with a profile of a Scherzer bridge in gilt. In the dedication Mr. Scherzer acknowledges his indebtedness to his brother, William, who died in 1893. The book begins with the mediaeval pivot or trunnion bascule bridge and follows the development of the type to the Scherzer. It is particularly voluminous in its reference to the development of the type along the Chicago river. The book is superbly illustrated and is for sale at $10 per copy.

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### REAR ADMIRAL KAUTZ RETIRED.

Rear Admiral Albert Kautz, who has just been relieved from command of the Pacific station, was placed on the retired list this week, on account of age. Admiral Kautz has had a long and distinguished career, of which nearly eighteen years were spent at sea. Born in Brown county, Ohio, he entered the naval academy in 1854, and his first sea service was on the frigate Colorado attached to the home squadron. In June, 1861, he was captured near Cape Hatteras by the privateer Winslow and incarcerated at Richmond. On his release in 1862 he was assigned to the Hartford, and served in the engagements at forts Jackson and St. Philip, the Chalmette batteries and at the capture of New Orleans and Vicksburg. Later during the war of the rebellion he served on the Juniatta of the West Indian squadron and on the sloop Cyane. Subsequently he was attached to the Winooski of the home squadron, on the flagship Pensacola of the Pacific squadron, on the receiving ship New Hampshire, on the Monocacy on the Asiatic station and on the Michigan on the lakes. In 1884 he was assigned to duty in the bureau of equipment in the navy department and remained there for three years. He then went to the Boston navy yard as equipment officer. After traveling in Europe for three years he was ordered to the Portsmouth navy yard, and subsequently was made commandant of the Boston navy yard. During the Samoan troubles, about two years ago, Admiral Kautz was in command of the American forces in that quarter, and it was mainly through his firmness and conservatism that serious international complications were averted. He reached the grade of admiral in October, 1899, and at the time of his retirement was the third ranking officer in the navy, being subordinate only to Admiral Dewey and Rear Admiral Howell.

The following promotions will result from his retirement: Capt. M. L. Johnson, at the Boston navy yard, to be rear admiral; Com. Franklin Hanford, at Cavite, P. I., to be captain; Lieut. Com. Theodoric Porter, at the Port Royal naval station, to be commander; Lieut. James H. Grennon, attached to the Vicksburg, to be lieutenant commander; Lieut. (junior grade) E. S. Kellogg, at the Washington navy yard, to be lieutenant; Ensign Thomas D. Parker, attached to the Princeton, to be lieutenant, junior grade.

## "BATTLE OF THE STEEL GIANTS."

WALL STREET STOCK JOBBERS AND THE SENSATIONAL DAILY PRESS DO NOT SEEM TO HAVE BROUGHT IT ABOUT AS YET—RELATIONS OF THE BIG INDUSTRIAL ORGANIZATION.

In an editorial of considerable length the Iron Age of New York reviews the sensational reports that have appeared in the daily press during two or three weeks past regarding "the steel war." The "battle of the giants," repeatedly referred to in reports from Wall street, has certainly not materialized as yet. The editorial, which follows, reviews in a conservative way, the relations existing between the large steel industrial organizations:

"The steel trade has had the misfortune to attract the attention of the sensational daily press and of the stock jobbers in Wall street, a fact with which the industry must learn to deal as a natural outcome of the floating of so many public companies. It would be idle to deny that this is a factor with which those engaged in the business must reckon to some extent. A good many people utterly ignorant of the industry have become partners in iron enterprises either as temporary holders of stock or as investors in steel securities. They can be worked upon and are influenced greatly by newspaper reports and brokers' tattle. Nor is it wise to blink at the fact that Wall street quotations on steel stocks do exert an influence on the iron trade proper. Every one knows that a certain discount must be applied to every statement which appears in the daily press. Generally speaking, the majority of readers do not make it large enough. The difficulty is to discover whether there is a grain of truth in the mass of rubbish of conjecture and of gossip.

"We have had an extraordinary outburst lately, in flaming headlines, about the 'Steel War,' from which one would infer that the industry is on the eve of the great battle between the giants which every one familiar with the industry expects to occur at some time. It was not long after the great consolidations were formed that two tendencies developed which gave promise of very active competition against them. The first was the creation of new works, some of which were built with the deliberate purpose of being sold out to the particular consolidation at which they were aimed. Until now no punishment has been inflicted upon any of these 'strikers,' while some of the new plants have already been bought up. The second grew out of the fact that the large new concerns determined to go back to the raw material, so as to control their own sources of supply. That was a policy long pursued as to ore by the Illinois Steel Co., as to fuel by the Carnegie and other concerns in Pittsburg, and as to both coal and ore by the Cambria Steel Co. and Jones & Laughlins. Subsequently, through the influence of H. W. Oliver, the Carnegie Steel Co. began its campaign for the control of lake ore properties. In the east the Pennsylvania and Maryland companies had years since turned to Cuba, while the Lackawanna company rested upon the supply of the famous Cornwall ore hills.

"When the era of consolidations came, the Federal Steel Co. needed only, for rounding up, the purchase of coal property. The National Steel Co. and one of the affiliated concerns, the American Steel Hoop Co., acquired important ore mines at the time of their organization and strengthened their position by developing coal lands. The American Steel & Wire Co. has taken a similar course, and the Republic Iron & Steel Co. has also become a miner of lake ore. One notable exception has been the National Tube Co., who did not even acquire the important ore property controlled by some of the directors of one of the constituent companies. Another development, of more potent direct influence in shaping the relations between the great producers and incidentally in leading to an expansion of productive capacity, was the desire to control the intermediate materials, so as to become independent of outside supplies. This led to the building of blast furnaces, which we may note incidentally threatened the existence of the individual outside pig iron producers, and to the enlargement and construction of steel works. The latter emphasized a condition which had developed through the very act of consolidation. The rolling mills, the consumers of billets and bars, by alliance with steel works were withdrawn from the open market, and those were robbed of their old time customers who had formerly supplied them. Thus the old American Steel & Wire Co., once the largest purchasers of billets in the market, supplied from their own plants a large proportion of their steel and were working toward complete independence. It was only the danger of inviting competition in their own finished products, which led the concern to renew their large contracts for wire rods with the Illinois Steel Co. The National Steel Co. gathered in practically all the tonnage of tin plates, sheets, hoops and a large share of the bars in the central west by their identity of interest with the American Tin Plate Co., the American Steel Hoop Co. and the American Sheet Steel Co. Relatively the smallest proportion of their own requirements of steel is produced by the National Tube Co., and here, too, the starting of a new open hearth plant in the Wheeling district showed a disposition to reach independence. Special circumstances, which recent developments illustrate, led to a suspension of this work. The more recently formed Crucible Steel Co. of America has apparently determined to carry out the plan initiated before consolidation by one of the constituent companies of building a large open hearth steel plant.

"It was very early in the history of the consolidations that arrangements were made to adjust matters in such lines of finished goods in which they overlapped. There are a number of cases in which subsidies have been paid by one consolidation to the other to keep out of its field. Then there are other movements which have complicated the situation. Conspicuous among them is the transfer of the Lackawanna Iron & Steel Co. from Scranton, Pa., to Buffalo, where a very much larger plant will be erected, a part of whose product must find other outlets than rails. Finally we have the expansion of older works, which are now financing for extensive improvements, conspicuous among which are the Pennsylvania Steel Co. and the Cambria Steel Co., and, according to unconfirmed reports, the Federal Steel Co. As a last possible influence there are the new projects still in embryo.

"That, of course, reveals a somewhat complicated situation, and may explain to some extent the position taken by the Carnegie Steel Co., when the determination is expressed that henceforth there can only be one profit from the ore to the finished material. The situation has not come upon the iron trade in the nature of a surprise. It has been understood for a long time, and has only become more impressive as month after month has added new developments tending in the same direction. As for the building of the tube plant at Conneaut the trade continues in a skeptical condition. The plan of manufacturing steel there from the ore up, using cheaply hauled fuel, looks sound and logical. Its utilization for producing tubes is accepted with reserve, since it may be aimed as an offset against a large, new structural plant at South Chicago. It is not probably generally understood in the steel trade that the material required for the steel pipe of the largest consuming interest is now made by the Carnegie Steel Co., the National Tube Co. converting it into the finished article. This accounts for upward of 10,000 tons per annum, and it is not likely that the principle of purchasing the steel by the pipe consumer is likely to be abandoned readily.

"That the general situation as outlined will become serious, ultimately, unless there is a heavy consumption, at home and abroad, cannot be denied, but it is a very different matter to create the impression that the immediate future is imperiled. As a matter of fact, many of the new undertakings and enlargements referred to cannot be completed under a whole year, and many will not come into play until far into 1902. Nor is it sure that even when that time occurs there will be the great battle of the giants which is pictured so vividly and is discounted so heavily. It must not be forgotten that much of the plant which is now being built and projected is really intended to supplant older equipment no longer efficient. It must not be forgotten that many small individual works will be forced out of existence. Nor is it certain that a reckless warfare will be inaugurated, in which all must be frightful sufferers. The large interests have shown a disposition thus far to act harmoniously. Not one of them has such overwhelming strength that the others can be cowed into submission, whether they are acting alone or in groups. All of them have great financial resources, and all, too, have fixed obligations to meet which will put a check upon wanton attacks.

"There is the possibility, too, that an identity of interests may be brought about by large financiers who have carried through more serious undertakings in other directions. In any case, the result of the formation of the large consolidations of recent years has been to stimulate rather than check competition, and the disposition displayed in some quarters to exact high prices and gather very large profits has invited attacks. Even if there should be a still greater aggregation of interests there will be brought home to them the conviction that there are limits to the lifting of prices, and that in the end costly opposition is created. We cannot help believing that in the long run the interests of the consumer will be protected by the inexorable law of supply and demand, there being no hope of controlling the mineral resources of this country and thus securing an unchallenged monopoly."

## ANNUAL MEETING OF SHIPMASTERS' ASSOCIATION.

During the present week the Shipmasters' Association is holding its annual meeting at Port Huron. Newspaper dispatches regarding the meeting have intimated that there was a movement on foot looking to amalgamation with the American Federation of Labor. Members of the association know, of course, that there is absolutely nothing true in this report. An organization of lake captains to be connected with the federation has been talked of, but it will never be the Shipmasters' Association, as the great majority of members of that body are positively opposed to anything of the kind. A dispatch from Washington announced that the rule of the government inspectors requiring shipmasters to take a supplemental examination every five years had been modified so that only masters who have not sailed for three consecutive years will have to take a re-examination to get certificates. All other masters will continue to get renewals without examinations. This change is due in a very large degree to the untiring efforts of Capt. A. J. McKay, president of the association. It is probable that an age limit of fifty years for members will be adopted before the association adjourns. The membership at present is 725. Since the organization was started $113,000 has been paid out to beneficiaries. The grand lodge has on hand $3,201 and local lodges have the following balances: Buffalo $410, Port Huron $503, Chicago $350, Cleveland $2,300, Milwaukee $150, Detroit $600, Marine City $150, Toledo $380.

## ANNUAL REPORT AMERICAN STEEL & WIRE CO.

The annual report of the American Steel & Wire Co. shows that the year has been a profitable one, though the declaration of a dividend upon the preferred and common stock has been deferred until the March meeting. The report says:

"The outlook for the coming year is certainly favorable, and as prices are now upon a normal level, we have no reason to fear a repetition of last year's experiences. We are now producing nearly all of our own requirements in pig iron and billets, and so are no longer subject to fluctuations in the prices of our raw materials. Our net profits for the year ending Dec. 31, 1900, were $7,002,129.14, after marking off for depreciation $1,000,000 and expending large sums in maintenance and improvements and marking down all inventories as required by the market prices of Dec. 31, 1900. As the company is now the owner of iron ore mines on Lake Superior, it was deemed necessary by the board of directors that we also become independent of possible freight combinations in transporting ore to our furnaces; and looking to this end, the directors have negotiated for the purchase from the American Steamship Co. of twelve large steel boats of capacity sufficient to carry practically all of the ore used by this company. This purchase was made by the guarantee on the part of the American Steel & Wire Co. of twenty-year 5 per cent. sinking fund bonds to the amount of $5,630,000 (this being the entire purchase price), secured by a mortgage on the boats purchased.

"Since the organization of the company there has been expended in the purchase of new property and in construction of new works the sum of $13,440,715.76. Finding it unwise and inexpedient to declare dividends payable a full year in advance, the bylaws of the company have been so amended as to enable the board of directors to act upon the question of dividends on both the preferred and common stocks, quarterly, beginning next March. The amendment of the bylaws makes it obligatory on the directors to act upon the question of dividends on both the preferred and common stocks of the company, quarterly, beginning with March next. Under this amendment further action on the dividend question on both stocks is therefore deferred until the meeting of the board the coming March. The board voted to advance prices of standard goods $2 per ton, effective at once."

## SENATOR DEPEW ON THE SHIPPING BILL.

HE HEARTILY ENDORSES IT IN A MOST ELABORATE SPEECH—VIGOROUSLY APPLAUDED IN THE SENATE—A WONDERFUL ARGUMENT.

Senator Chauncey M. Depew addressed the United States senate last Friday on the subject of the shipping bill. His speech was delivered with great force and effect and in a clear ringing voice which could be heard in the remotest parts of the chamber. It had been prepared in advance and he held the printed slips in his left hand while he used his right hand in gesticulations, but he spoke for the most time as if he were delivering an extempore speech. He had the closest attention from senators and from a large audience in the galleries. The peroration was spoken with great force and fire and when it was concluded the spectators in the galleries, in defiance of the rules of the senate, applauded with hand clapping, while the senators from both sides of the chamber crowded about Mr. Depew and warmly congratulated him. The senator's speech was as follows:

Mr. President, in every country its statesmen, political economists, and men of letters are writing up the results of the nineteenth century. Each nation in the old world finds in these statements causes for intense satisfaction. Each is able to make an exhibit of progress and development which gratifies the national pride and makes the people believe they are in the front rank at the commencement of the new century. While the rivalries and jealousies and war of contending figures and estimates among themselves continue, they are unanimous in granting to the United States the lead in almost everything which goes to make up the power and greatness, the advancement and development of any country. From 5,000,000 of population in 1800 we are 77,000,000 in 1900. From having little rank in agriculture and none whatever in manufactures, our productions now enable this enormous population to live far better than did our forefathers 100 years ago, and the surplus of our farms and factories is entering the markets and succeeding in competition all over the world. For 100 years the debtor nation, we enter upon the twentieth century a banker for all the governments of Europe. We have changed the continent which was a wilderness beyond the fringe of settlements on the Atlantic coast to great cities, thriving villages, prosperous farms, and active industries on the plains and in the mountains from the Atlantic to the Pacific and from the Gulf of Mexico to the Arctic Circle. Our railway lines, covering the country with a network of steel, in connection with transportation facilities on the inland lakes, rivers and canals, have given to us an internal commerce greater than that of all the interchanges of all the nations of the earth by rail and water. In length of lines we number nearly one-half the mileage of the railways of the world. There is everywhere an earnest search for the factors which produced these astonishing results. We freely admit that natural advantages were essential to our political and industrial victories, but natural advantages lie dormant unless the motive power and creative genius exist which shall utilize their opportunities. Our virgin soil, our climatic conditions, the limitless wealth in earth and forest and in mountain were all here, and had been for ages. Distance and isolation from European paternalism gave exceptional opportunities for the growth of civil and religious liberty, for the growth of that individualism in thought and action which has created millions of architects contributing to their country's greatness. But no unprejudiced observer can fail, upon careful study, to be convinced that the United States of today owes nearly all that it is to the wisdom of Washington, Hamilton and Jefferson in the initial legislation which they conceived for developing American industries and American industrial independence by the policy of protection.

In the one hundred years there have been a few deviations from this beginning, each one of them followed by panic, industrial paralysis, and general distress. Since the close of the civil war in 1865, except for the experiment under the Wilson bill of 1893, the policy of the fathers has been the practice of the country. In this thirty-five years we have witnessed the most remarkable part of our country's growth. The development of our resources has furnished ample opportunities for the enterprise of our people and for the useful employment of their wealth, and necessitated the borrowing of large amounts of foreign capital. We have been so absorbed in production that we have neglected utterly the equally important question, if we are to be a world power, with all which that means, of our position upon the ocean. In other words, our development and growth have been one-sided. We have crowded upon our rails, our lakes, our rivers, and our canals an output from every avenue of production which must find markets or produce stagnation and distress beyond our dreams, without any provision, so far as our government or our people or our flag is concerned, for its carriage beyond our own seaboard. The farm, the factory, and the mine have filled the warehouses and docks of our Atlantic and Pacific coasts with their contributions to national wealth, employment, and the happiness of our people, and left their transportation to Europe, to Asia, to Africa, to South America, and to Australia to the greed of foreign ship owners, to the protection of foreign flags, and to the hazards of foreign wars.

A general collision, which is often predicted in the European newspapers, among the great powers of Europe, in the mad haste of their navies and armies to outstrip each other in the acquisition of spheres of influence in Asia and Africa, would act upon the United States, who might be simply a spectator of the conflict, as an embargo upon our coast. We would be shut up within ourselves as absolutely as if the navies of the world were blockading our ports. Outside the material advantages of owning and operating our own merchant marine under our own flag, it is humiliating, not only to our pride, but also to our self-respect, that we should thus, upon the ocean, have the industry, capital, labor, and living of our people dependent upon the whims, the jealousies, and the animosities of the sovereigns and the cabinets of Europe.

### WE HAVE A MARKED GENIUS FOR THE SEA.

Now, to return to a brief investigation of why a people who showed such marked genius for the sea at their beginnings should have developed in such a marvelous way upon the land and surrendered their position upon the ocean to countries as insignificant in population and power, compared with ourselves, as Norway, with 2,000,000 of people, and Belgium, with 6,000,000. In 1807, with a population of 7,000,000, the United States had a larger registered tonnage for the foreign trade than in 1901, with 77,000,000 of people. In 1852 the United States was foremost among maritime nations, and now the least. We constructed at that time a greater tonnage than Great Britain or any other nation, while in 1898 we built of ocean-going steam vessels a tonnage of 16,382, against Germany of 130,667 and England of 1,301,325. There is but one line, of four ships, carrying the American flag and having an American registry, between United States and Europe. There are not ten American ships in the Pacific trade available for the development of the Philippines and the commerce we expect in the Orient. It requires about 5,000,000 tons of shipping for the transportation of our foreign commerce, valued last year at about $2,000,000,000. Of that 5,000,000 tons of shipping the United States has only about 350,000 tons in the foreign and deep-sea trade. There is but one answer to the question of this almost inconceivable discrepancy between progress on the land and on the sea, and that is that our statesmanship has neglected the ocean and permitted our own commerce to slip out of our hands.

Reciprocal commercial treaties with foreign nations gradually swept away every vestige of the protective features adopted during Washington's administration. We were still able to maintain ourselves so long as wooden ships held the ocean. Our virgin forests beside the ship yard, the genius of our naval constructors, and the inventive faculty of our naval designers enabled us to overcome the great difference in expense in operation and building resulting from the higher wages paid to American mechanics and seamen.

### GREAT BRITAIN'S ADVANTAGE IN IRON SHIPS.

The advent of iron steamships at once gave Great Britain the advantage. She had cheaper iron, cheaper labor, cheaper operations, and cheaper maintenance. Great insurance companies discriminated against the wooden ship; various vexatious tonnage duties discriminated against the American ship, steel, iron, or wood, and the United States was out of the race. Happily for us the enemies of the American merchant marine have never been able to repeal the protection which was granted to vessels in our coasting trade. Under our laws foreign ships were excluded from our domestic commerce. The result has been that the construction of steamships for our coasting trade has kept alive the few ship yards which we have. But for this preserved remnant of a wise policy, the United States, with 3,000 miles of coast and innumerable harbors on the Atlantic and hundreds of miles on the Gulf and Caribbean sea, and a thousand miles or more on the Pacific, would have been as isolated from the element upon which it should be supreme as Tartary or Tibet. The question which is far above politics or partisan considerations, which is purely patriotic, and upon which, except as to methods, there cannot possibly be any division of opinion, is, How can our merchant marine be built up? The suggestion which has attracted most attention and held it for the longest time has been free ships—in other words, the liberty of purchase and entry upon American registry of ships built anywhere in the world. There never has been, and there never will be, a better or more eloquent presentation of that phase of this question than was given here by the distinguished senator from Missouri (Mr. Vest) in his speech, which is upon our desks in the Congressional Record this morning. We have in that speech all there is that is persuasive or that is possible to be put upon that side. We have fought out this question in our protective politics so triumphantly that the argument need not be restated now. The argument of the distinguished senator from Missouri, turned from the ocean onto the land, would have taken away the protective principle from our industries at the beginning, and we would be upon the land just where we are upon the sea, dependent upon foreign nations for everything we produce, except agriculture.

### DISCRIMINATING DUTY IS NOT PRACTICAL.

Discriminating duties have been suggested by which there would be a heavier duty charged upon goods coming into our ports in foreign ships than those coming in under the American flag. To accomplish this we would have to abrogate about fifty treaties with foreign powers. It has been demonstrated, as in the case of France recently, that no nation can successfully impose discriminating duties without retaliation. The French government was forced to repeal within a year its effort at discriminating duties. No nation can submit to retaliation which is a seller more largely than a buyer. Either discriminating duties on imports or bounties for export would lead to European nations retaliating upon the things which we have to sell them, in a way to give advantage and stimulate production in Russia, in Egypt, in India, and in Asia against our wheat and our cotton. All nations are agreed that their merchant marine can be built up only by bounties. The bounties paid last year by the different maritime nations were $26,000,000 in round numbers, against $1,000,000 in round numbers by the United States. German statesmen discovered that if the empire was to find a market for its growing surplus it must have its own ships. Within the past few years the German government has been increasing directly its subsidies, has indirectly been giving rebates to the steamships over the state railways and has lent every possible government encouragement to the enlargement of German ship yards and the construction and operation of German steamships. The result has been that Germany has stepped into the second place among maritime nations, although she has so little coast and so few ports. The advance of Japan by the same processes has been almost incredible, in fact so great that she is now reaching out for the control of the commerce of the Pacific.

The amount proposed for annual subsidy under this bill is $9.000,000 a year. As the ships receiving the subsidy have to carry the mails free, we can deduct the present mail subsidy, and so the amount is reduced to about $7,750,000 a year. The outcry against this sum as being enormously in excess of any benefits that can be derived from it can only be accounted for on the ground that it is promoted by the literary bureaus of foreign lines. We paid last year for pensions $145,000,000. This sum is the annual expression in money of the gratitude of the country to those who have fought its battles and won its victories. Six per cent. upon this sum would carry the American flag, for which these men fought, upon American ships, loaded with the products of the American farm and factory, to every country on the globe. The river and harbor bill this year as it passed the house carries $60,000,000, of which one-quarter is for local pride and local sportsmen and three-quarters, or $45,000,000, to improve American facilities for foreign ships. We appropriate over $100,000,000 for the army and $77,000,000 for the navy, and 4½ per cent. upon this would carry the American flag upon American merchant vessels, laden

with the products of American industry, upon a mission of commerce, peace, and civilization all over the world.

The bill creates no favors, it fosters no interests, but it lays down universal rules by which the capital and enterprise of the people can demand their share of this subsidy. It is restricted to no class of vessels, but is given upon a scale adjusted after most careful consideration to every kind and every tonnage of steamship, to the sailing ships and to the fostering and encouragement of our fisheries, which are the nurseries of our seamen. Its purpose is to give to each class of vessels the amount, and only the amount, necessary to equalize the cost of construction, operation, and maintenance of that class of vessels with the cost of construction, operation, and maintenance of similar ships sailing under foreign flags. Of the three principal objections raised against the bill, the first is that the existing lines will get all the money. Of the $9,000,000 per annum, the amount which the American line can earn is $1,100,000, being the sum which passed the senate in the original postal subsidy bill, but which was changed in the house. The amount which can be received by the ships of that company and all other 21-knot steamers hereafter built combined cannot exceed $2,000,000 a year. That leaves $7,000,000 for the purposes which have been so eloquently argued by my friend from Georgia (Mr. Clay) for the lower-speed freight ships. Certainly the Americans who have risked their money and given their brains and experience to this badly handicapped struggle for an American merchant marine ought not to be punished for their efforts. The testimony conclusively shows that even under the present mail contracts the four fast ships of the International Navigation Co. are run at a loss.

### THE SENATOR DISSECTS THE BILL.

The next objection is to high-speed vessels. It is charged that they are not essential to the development of American trade with foreign countries. It has not been the characteristic of the American people to yield to each other, much less to foreigners, on a question of speed. It is not poetry or sentiment which inspires Germany to build the Kaiser Wilhelm der Grosse in order to beat the record of the Majestic, and to expend three and a half million dollars to build the Deutschland to excel in speed the Campania, or which leads the most prudent of all investors, the French, to struggle so desperately to construct steamships which may equal, if not excel, the British and the German in quickness of passage across the Atlantic. In transportation speed is desired. It is the gauge by which peoples judge the maritime skill, genius and enterprise of other nations. No American has been abroad and no American has read the record of ocean voyages who has not had comfort when our little fleet bore the palm, or felt mortified and annoyed when this little spark of maritime life was extinguished by superior enterprise and ambition among Germans or English. England, Germany and France have their own reason for giving large subsidies for these great ocean greyhounds. It is that they may have them for auxiliary war ships in time of war.

The next objection is that the bill does not give sufficient encouragement to the tramp steamer; in other words, to the slow or 10-knot or 11-knot steamship. Figures show that the excess of compensation under this bill to the 10-knot or 11-knot steamship over the cost of operation and maintenance is greater than for the high-speed steamer. It costs eight times as much to run a 21-knot steamer as it does a 10-knot steamer. Neither the high-speed steamer nor the tramp can find business except upon established routes, where commerce and intercommunication in trade are fixed. It is the middle-class steamer of from 14 to 17 knots speed which builds up commerce. It carries few passengers. Its main cargo is freight—cereals from the farm and the heavy machinery from the factory. These vessels will be required to build up the commerce between San Francisco and Hongkong and Yokohama, between American ports and ports of South America, between American ports and the numberless ports in different parts of the globe which now never see the American flag and know nothing of the products of the United States. After the middle-class vessel, which receives the largest compensation over cost of operation under this bill, has created a steady and remunerative trade between an American and foreign port, then will come the demand for the swift passenger and mail boat and for the cheap tramp.

### WE MUST BUILD FROM THE BOTTOM.

We must not forget in this discussion the fact which it is almost impossible for an American to comprehend, that while the sea power is acknowledged now by all statesmen to be the controlling element in the world's affairs, we must build ours up from the bottom. We have no ships; we have totally inadequate ship yards; we have no routes of commerce; we have no banking facilities in foreign ports; we have few agents in foreign countries for promoting the sale and advocating the merits of American productions. Whatever facilities and opportunities in these directions are granted to us come through the hands and by the agencies of countries who are our commercial rivals and daily becoming more jealous of our commercial growth and more inimical to our commercial power. The subsidy under this bill covers only about one-quarter of the cost of maintenance and operation for any class of vessels. Therefore every ship which derives benefits from the measure must hustle for cargo and succeed in getting it, or make its voyage at a loss. The subsidy works automatically in the promotion of an American marine. If by experience the compensation proves so large that there is an undue profit, immediately American capital puts more ships in commission and enlarges the merchant marine. If our merchant marine, by reason of its prosperity, grows beyond the amount which is appropriated, then it is distributed pro rata, with a diminishing compensation to each of the beneficiaries. It was found, on investigation, that Americans whose business education and experience had been in ocean transportation, after struggling vainly to live under the American flag and American registry, handicapped by the excessive cost as against the European flag and registry, rather than retire from business purchased ships abroad and are sailing them under the Belgian and other flags. There will be available of this class of vessels now running and under contract about 300,000 tons, but an amendment has been accepted limiting the privilege to 200,000.

This will be an immediate addition of that amount to our American merchant marine. It will enable these Americans who have experience to work under the American flag, and we will get the advantage of their commercial and transportation skill for the purposes of promoting the increase of the American merchant marine and the enlargement of American commerce. They can come in with their ships, however, only on half the compensation which is allowed to the American ships now sailing under the American flag, or hereafter to be built in American ship yards, and before that one-half compensation can be secured they must build an equal amount of tonnage in American ship yards, by American labor, to be sailed under the American flag. It is estimated that there is paid by American producers to foreign ship owners in freight charges at least $175,000,000 a year. Four per cent. upon this would give us an American merchant marine and the expenditure of the greater part of this money in our own country. Political economists and statisticians in foreign lands do not hesitate to say that there is no country in the world which could stand this drain of $175,000,000 paid to foreigners, to be expended in foreign countries and for foreign labor, except the United States. It is estimated that if our tonnage was carried in American bottoms, and the money paid to American ships, and American ship yards enlarged to meet the demands of American construction, there would be direct employment given to nearly 200,000 men. The indirect employment—in the steel mills to the makers of the plates and frames, in machine shops to the makers of the machinery, in the iron ore mines to the delvers for the ore, and in the coal mines to the laborers in coal—would be equally great, if not greater, while the farmer, upon the well-known principle that the proximity of the market for his produce and the saving of transportation add to his profit, would have these additional markets at home for the products which now are carried great distances and transported abroad at his expense before he can receive the benefits of his harvest. Every transportation man, indeed every business man, knows that the infallible test of any enterprise is the confidence which it inspires among bankers and investors. With money so plenty that it commands, upon gilt-edge securities for permanent investment, only 3 per cent., and in temporary loans averages but 2, capital in the hands of enterprising, energetic, and venturesome Americans is always seeking remunerative work. In London, Paris and Berlin the bankers are eager for the bonds of the English, the French, and the German lines as security for loans, while the investing public are equally anxious to secure an interest in those enterprises. It is almost impossible, as I know from having seen those securities come before the finance committees of institutions, for the American ship owner to secure, at any rate of interest, a loan upon his securities. They must be backed up, outside of their intrinsic merit, by abundant personal indorsement.

### HISTORY OF TRANSPORTATION IS REDUCTION OF RATES.

The whole history of transportation in the United States is the story of constantly reducing rates upon railroads; this constant reduction going, not to the stockholders or bondholders of the railroads, but to the farmers and the manufacturers in the reduction of freight charges. American railways started with charges per ton per mile equal to those of foreign countries, and now they are less than one-third of those charges. The same law—the inevitable law of profit promoting competing opportunities—will act upon the ocean. The struggle for business will stimulate business at the same time that the bid for business decreases the rates. In a few years the farmers of the country will have the benefit of this decrease in lower freights upon the ocean, as they now have it in this diminished cost of carriage upon the rail, without which no farmer could raise and have carried to the seaboard his harvests from the great western or northwestern states. The American captain and the officers of American ships would be advance agents wherever they landed for the goods which they carry. With the American merchant marine will come the American banker in the central ports of the world, and beside the American banker will be the live, hustling, and invincible American agent for the sale of American products.

Great productiveness has its perils as well as its advantages. Our surplus exported last year amounted to about $1,500,000,000, and will constantly increase. Any check upon its markets abroad or its facilities for reaching them must cause at once suspension of both enterprise and employment. We have coming to the front every year from our schools millions of youths who must of necessity join our industrial army. Every measure or enterprise or employment of capital which takes care of them is a blessing to the workers already in the field, as well as to those recruits who are adding to our national power and wealth. As I have said before, with our merchant marine, our ship yards and our ships and their contributing industries will enlist hundreds of thousands of them; but the other hundreds of thousands must be cared for by finding profitable sale for that which they produce.

What New York wants with her commanding financial, commercial and industrial interests, what the country needs and needs now, is a merchant marine, and the principles of this bill are the only practical methods in sight for the accomplishment of that purpose. We are not interested as to who of our fellow citizens gets the money if they earn it, but we are deeply concerned that somebody shall get it who will construct ship yards and build and navigate American ships.

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## TWO CRUISERS AND A BATTLESHIP.

[Special to the Marine Review.]

Newport News, Va., Jan. 30.—Much interest is felt here in the announcement that representatives of the navy department and of the Newport News Ship Building & Dry Dock Co. have come to terms in reference to the matter of constructing one of the sheathed battleships for which bids were recently opened and regarding which there was a hitch on account of the high prices demanded by the builders. This means that this yard will build two of the armored cruisers and one battleship. On account of sentimental reasons it is earnestly hoped that the battleship constructed here will be christened Virginia, as everybody recognizes that it would be in accord with the eternal fitness of things for the Virginia yard to build the vessel which is to bear the name of the "Old Dominion." It is also hoped that one of the cruisers to be built here will be the Maryland.

The bid of the ship yard on the joiner work for the rebuilt North German Lloyd steamer Main has been sent to the headquarters of the steamship line in Germany. If the local company is successful in securing this part of the contract the entire job will reach in the neighborhood of $1,000,000, as the steel work foots up something above $600,000 and the cost of the woodwork is estimated at something like $300,000. It is undoubtedly the largest repair contract ever tackled in this country, and when the vessel leaves the dock here she will probably be in just as good condition as she was the day she went into commission.

## PECULIARITIES OF LAKE STEAMERS.

BY THEODORE LUCAS.

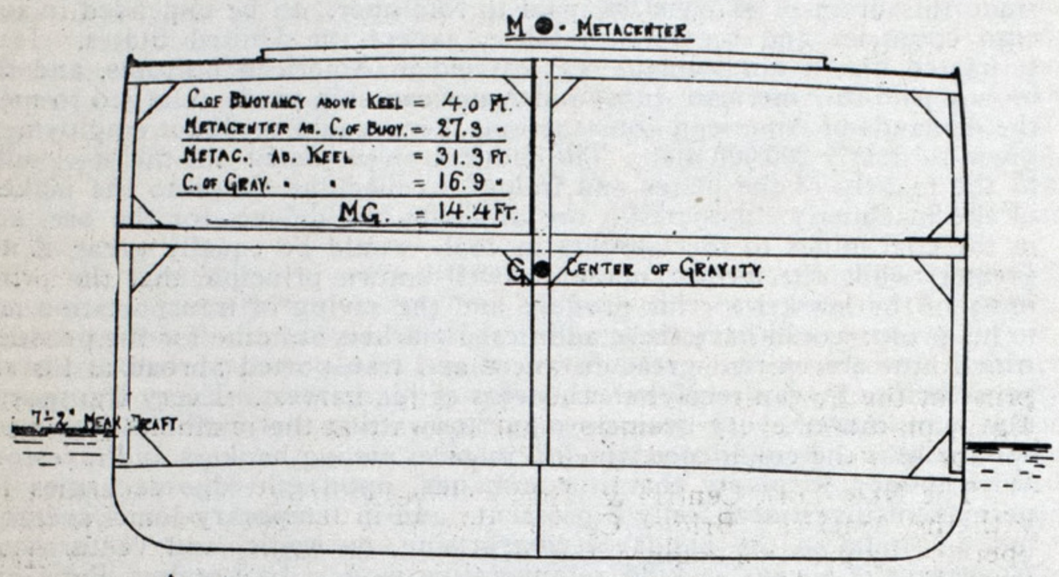
Natural conditions have exercised a very pronounced influence upon the design and the operation of steamers navigating the great lakes. Limited draught of channels has been of most importance. It has made shallow depth a logical consequence in the ships, particularly as lake waves are not so formidable as to require a very high free-board. This small depth in turn limits, to some extent, the length and somewhat the breadth also. Lately through greater attention to good distribution of material in the section of the ship, ratios in length to depth of about 16 to 1 have proved quite successful.

Such proportions can be adopted safely, as lake waves, while quite often steep, have not time to grow very long, and the present long ships seem to rest therefore on several waves with a fairly well distributed support.

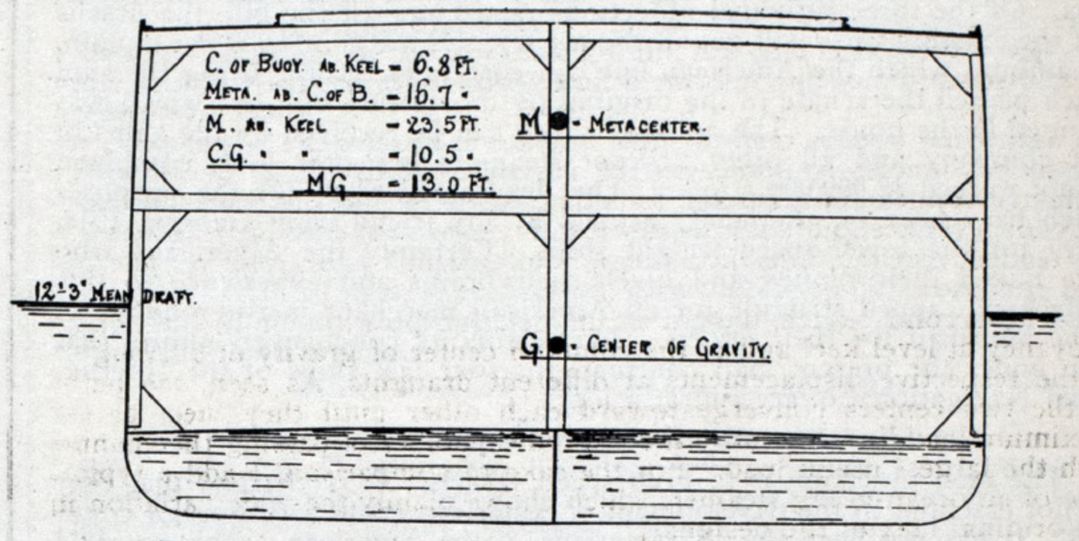
An improvement is possible, however, in the distribution of the strains, which are still quite severe on the upper works with their enormous deck openings. The neutral axis is only about one-third of the total depth above the keel, throwing nearly twice the strain on the upper fiber than on the lower fiber. The absolute amount of strain cannot be determined with certainty, but even with only four tons strain on the bottom, the top may get eight tons, which, as it is about one-half the average elastic limit, may, under alternate tension and compression, prove rather severe for the material.

The initial stability of lake steamers is usually quite high, where breadth is the one nearly unrestricted dimension. We find proportions of successful sailing ships like 50 ft. beam by 28½ ft. depth or 52 ft. beam by 30 ft. depth, proportions which without any top weights give on an average metacentric heights of from 4 to 6 ft. in loaded condition, while in light condition, with water ballast, they largely exceed these values. Different methods and devices are employed to ease the vessels, one of which is that of admitting loose water into the open cargo holds, a rather dangerous practice, even on the lakes.

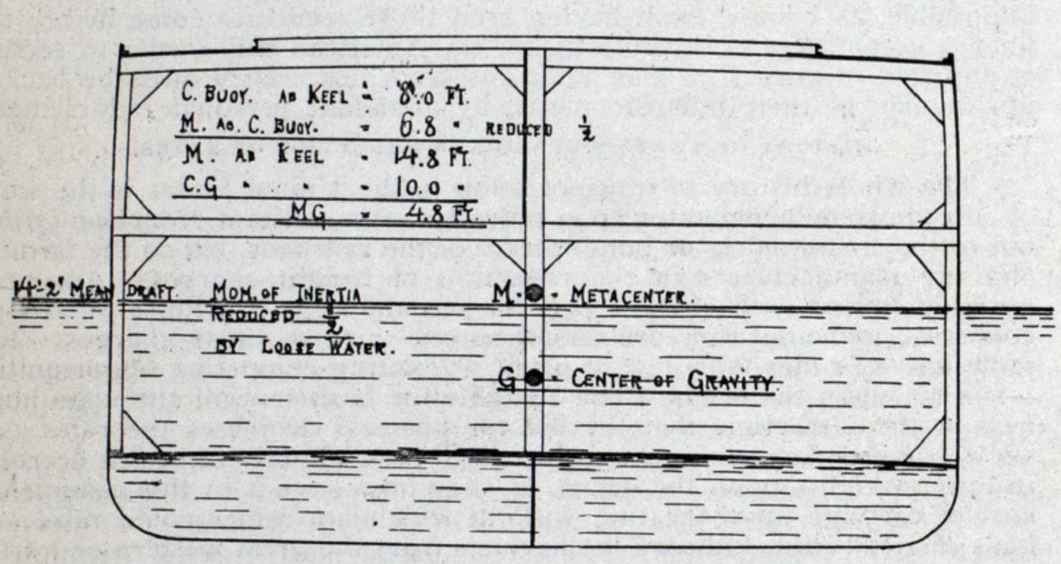
The accompanying four sections illustrate an average modern case. A shows light condition without ballast; B shows inner bottom full; C shows condition with about 1,000 tons free water in cargo holds, under such distribution that the moment of inertia of the water plane is reduced to one-half; D shows loaded condition. More desirable but less effective for reduction of metacentric heights are the raising of the boilers and coal bunkers on platforms as well as securing, through a very high water bottom, a higher position of the center of gravity of the cargo. Such a high initial metacentric height and 8 to 12 ft. free-board above nearly 18 ft. draught, are a combination highly conducive to wide range of stability under inclination.



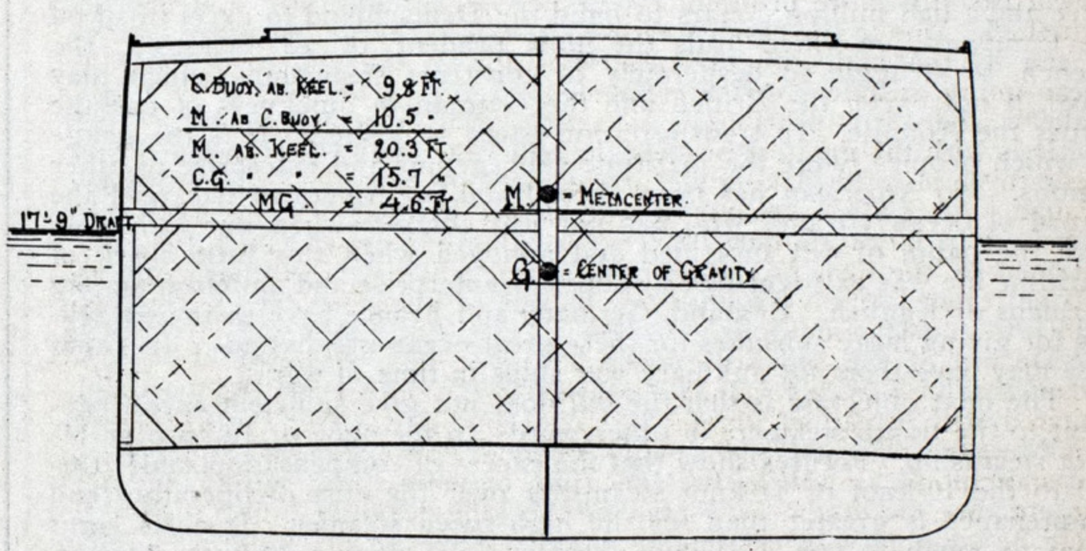

A. Ship in Light Condition Coal and Stores complete.



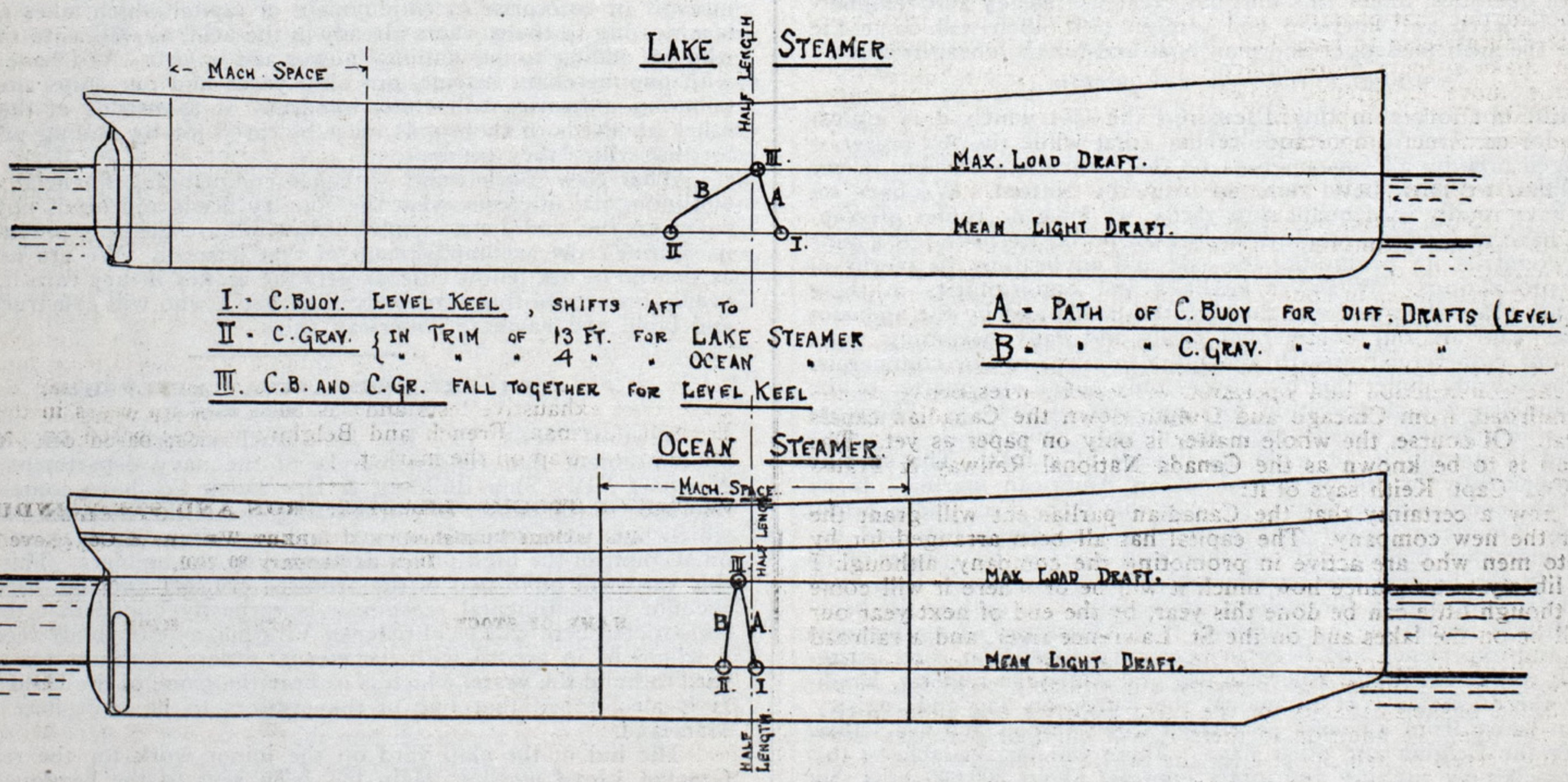

B. Ship Light with Ballast Tanks Full.




C. Ship as in B. and 40% of Ballast added Free in Hold.




D. Ship in Loaded Condition.




Lake vessels, however, have their reserve stability and reserve buoyancy so little called upon, that they could easily get along with a great deal less. As said before, depth is adopted more for strength considerations than anything else.

Trim, perhaps, is of the highest importance for lake vessels. Where the ships load to the maximum of their draught allowance, often keeping only a few inches from the bottom of the channels, a level keel in deep-load condition becomes, for the commercial success of the ship, an im-

perative necessity. The design has therefore to be prepared with the utmost care to realize the coinciding of the center of buoyancy at level keel and the common center of gravity of hull, machinery, coal and cargo. Certainly the ship builders on the lakes show in a most efficient manner to coast builders how such a desired trim can be attained to a nicety. It is to their advantage, however, that they are building a great many ships of the same type. All the trim conditions are very much aggravated by having the machinery and coal, in most cases, in the stern of the ship.

This position of the machinery is highly characteristic of the lakes and of vital importance for the ship in several directions. The ship secures by it an unbroken cargo hold with uniformity in the spacing of hatches, which is much to the advantage of rapidity of loading as practiced on the lakes.

The center of gravity for the light condition of the ship is drawn a great distance aft of the midship section, sometimes as much as 6 to 8 per cent. of the length, securing by it a trim of 8 to 14 ft. on an average for the light condition. A trim of such magnitude enables the wheel and rudder to be sufficiently immersed for moving and handling the ship. In such an arrangement it is often found advisable to shift the center of buoyancy for level keel quite a little distance forward of the midship section, as the tendency of the unbroken cargo hold is trim by the head for the full load condition.

The second sketch illustrates the relative position of the center of buoyancy at level keel and of the common center of gravity of all weights in the respective displacements at different draughts. As seen, the paths of the two centers converge toward each other until they meet at the maximum load line, to realize the desired capability of passing the channel with the largest useful load. For the sake of comparison, I add a typical case of an ocean-going steamer, which shows plainly the wide variation in the original idea of the designs.

If owners of lake vessels figure on taking advantage of deeper channels in the future, care must be exercised to get the center of buoyancy far enough forward to prevent trim by the head. The tendency of trim forward is still more pronounced as the coal is consumed and the stern lightened. Due to the easier weather conditions, no undue strain seems to be felt by the hull with this after position of the machinery. Among ocean-going steamers this arrangement seems to find favor only in oil tankers, where it is possible to ballast the ship up to full load.

It is with the greatest interest that the outcome of the present experiment to employ the lake style of steamers in Atlantic coasting trade is awaited. After a few seasons of hard winter weather with numerous trips in ballast, a large amount of very valuable experience shall have been obtained by the owners and their technical advisers. Another point that will be tested is the very high co-efficient of displacement and its desirability for coast conditions.

Details of the practical construction of lake steamers show some remarkable and highly valuable characteristics, many of which could be imitated with great advantage by coast builders. The arrangement of quick bilges, straight margin plates, channel floors, channel and T beams and stanchions, as well as the execution of templating, setting up, riveting, etc., are, no doubt, facilitated by the long, straight midship part, but could be adopted with reasonable modifications for any kind of merchant ship construction. The impression is abroad that lake ship builders can build steel into ships at 10 to 15 per cent. less cost per ton of material than the Atlantic coast builders.

The most pronounced type of lake craft is the slow-speed, full-bodied freight carrier, mainly for ore, coal and grain, but also, with modifications, the package freighter. There is, additionally, a class of speedy vessels for transportation of passengers only. Among these is a large number of paddle-wheel steamers, some not much different from the coast steamers with beam engines, while some of the latest have the most improved diagonal engines, like the Tashmoo of Detroit, a highly efficient type of steamer.

For the through-going, fast passenger traffic, the twin screw type seems to be the one that promises to be the most efficient. The designers of these latter ships seem to have had to contend with a great many difficulties that make success more difficult than with ocean-going vessels. With a little more experience, however, the fast, through passenger steamer will add another important feature to the constantly growing industrial and commercial importance of the great lakes.

## PROPOSED NEW TRANSPORTATION ROUTE.

Capt. J. G. Keith, vessel owner of Chicago, is associated with Canadian interests that are promoting a scheme for the construction of a railroad from Collingwood on Georgian bay to Toronto and for the operation of ships on the great lakes in connection with the railroad. It is proposed to have ships from Duluth and Chicago feed the railroad at Collingwood and also to have a line of vessels operating down Lake Ontario and the St. Lawrence river from Toronto to Montreal. The scheme also contemplates the construction and operation of vessels, irrespective of the proposed railroad, from Chicago and Duluth down the Canadian canals to Montreal. Of course, the whole matter is only on paper as yet. The organization is to be known as the Canada National Railway & Transportation Co. Capt. Keith says of it:

"It is now a certainty that the Canadian parliament will grant the charter for the new company. The capital has all been arranged for by the Toronto men who are active in promoting the company, although I am not at liberty to announce how much it will be or where it will come from, and though little can be done this year, by the end of next year our vessels will be on the lakes and on the St. Lawrence river, and a railroad of our own will be in operation. The line will almost revolutionize lake transportation. At the outset the company will probably build five or six vessels of 150,000 bushels capacity for the Lake Superior and Lake Michigan end of the line. In addition to them it will build or purchase three times as many vessels of half the size for the St. Lawrence river and Lake Ontario part of the course. As sailing is slower on this part of the route, double the number of lake vessels would not do on the eastern end. The railroad will be amply sufficient for both freight and passenger service.

"The company will plan to erect elevators at both Collingwood and Toronto, to be used if it is desirable, but most of the grain, as well as most of the ore, will be sent straight through without the use of elevators. The system of grain handling is so well developed that it is cheap and rapid. At Toronto, for instance, the cars of grain will run on a trestle, from which the grain can be turned direct into chutes that run to the holds of the vessels. In the same way ore will be hauled in copper-bottomed cars, and dumped direct to the boats. As less than 200 miles of Lake Ontario are to be traversed, there will be little danger of delays from storm, and less trimming of the vessels will be needed, in this a saving being effected. The route may gain a coal trade, but will not expect much of this, its main cargoes being lumber, ore and grain. For the present Montreal will be the eastern terminus, but the men behind the new company are thinking also of building ocean-going vessels, which can carry ore, for instance, direct from Toronto to Europe, or which can trade with Atlantic ports."

## TRADE NOTES.

Mr. Sidney A. Stephens of No. 22 St. John street, Montreal, was recently appointed agent for the Ashton Valve Co.'s pop safety valves and steam gauges throughout the Dominion of Canada.

The Atlantic Works, Incorporated, Philadelphia, is furnishing the Holmes Ship Building Co., West Mystic, Conn., one of their B 11 adjustable bevel band saw machines, which bevels both ways to 45°.

As announced some time ago, the J. A. Fay & Egan Co. of Cincinnati, manufacturers of wood working machinery, were awarded the "grand prix" at the Paris exposition, and now it is learned that Mr. Thomas P. Egan, president of the company, has been decorated with the Legion of Honor by the French government.

The New York Central & Hudson River Railroad Co. has contracted with the American Bridge Co. for two draw bridges, which are to be operated by gasoline engines, one of them to be located near New Hamburg, N. Y., and the other one near Little Ferry, N. J. Both are through plate girder bridges with double track.

An advertisement from the Ohio Fuel Co. on page 39 of this issue announces that they will be prepared upon the opening of navigation on the great lakes to furnish fuel to steam vessels in Cleveland, day or night, from dock or by steam lighter, as may be required. This company, which operated a dock during a part of last season at the mouth of the old river bed, Cleveland, recently purchased a steam lighter of 300 tons capacity. They announce that they furnish only the best grades of Pittsburg and Goshen steam coal.

Capt. M. Mulholland, who is supplying thousands of his patent hatch fasteners to vessels in all parts of the country, is now located at No. 46 Wade Building, Cleveland. A special corner bracket, which may be readily applied to hatches that have the ordinary form of fasteners, is meeting with very large sale. One hundred of these corner brackets are to be fitted on the Wilson Transit Co.'s steamers Rees and Thomas Wilson, and eighty of them are to be supplied to two steel freighters building at the works of the Detroit Ship Building Co.

The firm name Cole & Kuhls is now permanently connected with the use of seam composition for decks and other seams, weather checks, floors, skylights, etc. The material sold by Cole & Kuhls is known as elastic seam composition. Their headquarters are in the Borough of Brooklyn, N. Y., foot of Twenty-fourth street. Among large steamship concerns using this composition are the American line, Old Dominion Steamship Co., Panama Railroad Steamship Co., Ocean Steamship Co., Atlas line and L. Boyer's Sons. The composition is also used on the United States army transports and on the yachts Aphrodite, Anita, Coronet, Eleanor, Intrepid, Kismet, Nourmahal, Valient, Aileen, Buccaneer, Halcyon, Elsa, Chetolah, Fenella and many others.

Some forge shop plants have of late been provided with only a single fan blower designed to produce the blast for the fires and at the same time by means of a special piping arrangement to exhaust the resulting smoke from the hoods. In a recent paper read before the American Society of Mechanical Engineers, Mr. William Sangster says that "such an arrangement is not economical, since a much larger volume of air must be raised to a higher pressure than if a separate fan had been used for the exhaust system. In the case referred to we should have to handle five times 140 cub. ft. of air at 4 ounces pressure, requiring 1.25 H.P., instead of .44 H.P. for each forge. Even in a small system the power saved by the extra fan will pay for its cost in less than a year's time."

The Wm. S. Haines Co. of Philadelphia recently moved offices and factory to new and enlarged quarters at Eighteenth and Hamilton streets. The Haines company makes the well-known Heintz marine steam trap. Claims made for this trap are: It discharges water only and that at a temperature below 212°; the valve being at the inlet of the trap, the latter does not condense any steam; the trap may be set in any position and will do its work in all; it is the smallest and lightest trap on the market; it has the largest capacity for its valve size; it does not need constant attention and operates under any change of pressure from nothing to 200 lbs. or more; it has recently been officially adopted by the Russian navy after most exhaustive tests and has been used for years in the American, English, German, French and Belgium navies; based on capacity, it is the cheapest trap on the market.

## VALUE OF STOCKS—LEADING IRON AND STEEL INDUSTRIALS.

Quotations furnished by HERBERT WRIGHT & Co., Cleveland,
Date of January 30, 1901.

| NAME OF STOCK. | OPEN | HIGH | LOW | CLOSE |
|---|---|---|---|---|
| American Steel & Wire | 40 | 42⅞ | 39½ | 42⅞ |
| American Steel & Wire, Pfd | 84 | 86½ | 84 | 86½ |
| Federal Steel | 42 | 44⅜ | 42 | 43⅞ |
| Federal Steel, Pfd | 70 | 70¾ | 70 | 70¾ |
| National Steel | 39 | 40½ | 39 | 40¼ |
| National Steel, Pfd | ..... | ..... | ..... | ..... |
| American Tin Plate | 56½ | 56½ | 56 | 56½ |
| American Tin Plate, Pfd | ..... | ..... | ..... | ..... |
| American Steel Hoop | 26⅝ | 26⅞ | 26 | 26¾ |
| American Steel Hoop, Pfd | ..... | ..... | ..... | ..... |
| Republic Iron & Steel | 13½ | ..... | ..... | 13½ |
| Republic Iron & Steel, Pfd | 58½ | ..... | ..... | 58½ |

## AN ORDER INVOLVING FIVE MILLIONS.

THE NEW YORK SHIP BUILDING CO. SECURES A BIG CONTRACT FROM THE ATLANTIC TRANSPORT CO.—SEVERAL OTHER NEW CONTRACTS ARE NOTED IN REPORTS FROM SHIP YARDS ON THE SEABOARD.

The largest ship building contract for merchant craft that has ever been awarded to a ship building firm on the Delaware river at one time has just been awarded to the New York Ship Building Co., Camden, N. J., by President Baker of the Atlantic Transport Co., which has hitherto owned only foreign-built ships. It should be understood, however, that the company latterly gave a contract to the Maryland Steel Co. for two steamships. The four vessels are intended for the trans-atlantic service and will ply between London and Philadelphia, Baltimore and New York. Two of the ships are to be 600 ft. long and the others a few feet shorter. Their equipment will be equal to anything engaged in the Atlantic service. The two largest vessels are to be of 12,000 tons capacity, and the four when completed will cost the company over $5,000,000. Each vessel is to be constructed of steel throughout and will be built in excess of the underwriters' requirements. The machinery will consist of triple expansion engines, and boilers of the Scotch type, able to withstand the highest pressure for vessels of that type. This award, given to the New York Ship Building Co., makes eight steamships to be constructed by that concern, the others being three vessels for the American-Hawaiian Steamship Co. and a passenger steamer for Robert Dollar of San Francisco, to be engaged in the Yukon river trade.

The four-masted wooden schooner Edith G. Folwell was launched from the yards of the New England Co., Bath, Me., last week. She is built of selected material and is fitted with the latest improvements, including Hyde windlass, hoisting engines and wrecking pumps forward and aft. Her dimensions are: Length, 196 ft. 9 in.; breadth, 40 ft. 4 in.; depth, 18 ft. 4 in.; gross tonnage, 1,265. The keel, stem, stern posts, rudder posts and apron are white oak; ceiling and planking yellow pine; the latter is thick. The masts are Oregon pine. The lower masts are 100 ft. long; the fore is 28; jigger, 27, and the main and mizzen, 26½ in. in diameter. The topmasts are 53 ft. long. The rigging is wire set up with turn buckles; will spread 5,000 yards of canvas. She carries four anchors, two 4,000-lb. wood stock anchors and 200 fathoms of 2-in. chain; also an 800 and a 500-lb. iron stock anchor. The cabin is finished in quartered oak, cherry and mahogany, the arrangements commodious, and the furnishings up to date. The vessel is heated with steam. She will be ready for sea in a few days and will represent an expenditure of about $60,000, and will have a carrying capacity of 1,850 tons.

Bids will be opened at the navy department Feb. 1 for the construction of three protected cruisers. The following named firms have been furnished plans: Bath Iron Works, Bath, Me.; Burlee Dry Dock Co., Richmond, Va.; Cramps of Philadelphia; Crescent Ship Yard, Elizabeth, N. J.; Eastern Ship Building Co., New London, Conn.; Fore River Engine Co., Quincy, Mass.; Harlan & Hollingsworth Co., Wilmington, Del.; Maryland Steel Co., Sparrow's Point, Md.; Moran Bros. Co., Seattle, Wash.; Neafie & Levy Ship & Engine Building Co., Philadelphia; Newport News Co., Newport News, Va.; New York Ship Building Co., Camden, N. J.; Risdon Iron & Locomotive Works, San Francisco; Wm. R. Trigg Co., Richmond, Va.; Union Iron Works, San Francisco, and John H. Dialogue & Son, Camden, N. J.

The W. & A. Fletcher Co., Hoboken, N. J., has contracted with the Champlain Transportation Co. of Burlington, Vt., for a new side wheel steamer for Lake Champlain service to be completed in 1902. The hull will be built by T. S. Marvel & Co., Newburg, N. Y., and the general dimensions are as follows: Length of water line, 250 ft.; length over all, 262 ft.; breadth, molded, 35 ft.; breadth over guards, 62 ft.; depth, molded, 11 ft. 3 in.; depth amidships, 111 ft. 9 in. The engine is to be of the vertical, beam, jet-condensing type, with a cylinder 55 in. diameter and 10 ft. stroke, having feathering wheels with curved steel buckets.

It was announced last week that the two steamships which the Cramps are building for the Ward line will be named the Esperanza and Monterey. The Esperanza is far enough advanced to be launched in a few weeks and the Monterey is about six weeks behind. The ships are 341 ft. long, 47 ft. 6 in. wide, 36 ft. deep, and have a draught of 20 ft. The contract calls for a continuous speed of 16 knots. The vessels will accommodate seventy first-cabin, forty second-cabin and seventy-five steerage passengers.

Citizens of Pensacola are endeavoring to raise sufficient money to purchase a site for a ship building plant which New York capitalists have decided to locate there on condition that a site could be secured free. It is represented that the initial equipment will cost $600,000.

The Hartford & New York Transportation Co., Dutch Point, Conn., is building a steam barge for E. S. Belden of Dutch Point to cost $12,000. She will be derrick-rigged and equipped with powerful engines for the handling of heavy materials.

Sealed proposals will be received at the office of the light-house board, Washington, D. C., until March 2 for furnishing the material and labor necessary for the construction of the twin screw, steel, steam light-house tender Larkspur.

The Kennebec Steamboat Co. is in the market for a new steamboat. The hull will probably be built by the New England Co., Bath, Me., and the engines and boilers supplied by the Bath Iron Works.

A contract has been made with Kelly, Spear & Co., Bath, Me., for a four-masted wooden schooner of 166 ft. keel, 36 ft. beam and 18 ft. hold. Capt. Frank Oram of Bristol will be the managing owner.

A four-masted wooden schooner, the May T. Neville, was launched from the J. T. Hawley ship yard, Bath, Me., last week. Her dimensions are: Length, 195 ft.; breadth, 40 ft.; depth, 18 ft. 4 in.

The navy department has made a contract with the Holland Torpedo Boat Co. for the construction of an additional submarine boat, to take the place of the Plunger.

The Bendixen Ship Building Co., Eureka, Cal., is building the barkentine Kohala for Hind, Rolph & Co. of San Francisco.

### WINTER NAVIGATION OF THE ST. LAWRENCE.

Upon the subject of the winter navigation of the St. Lawrence river, Mr. J. Kennedy, chief engineer of the Montreal harbor commission, has made the following report:

"In answer to the question of the board as to the advisability of an effort being made to keep the St. Lawrence open all winter at Cap Rouge, and as far above as may be found practicable, by the use of the government ice-breaking steamer Stanley, I beg to say that I consider it of great importance that such an effort be made. It is, I think, established that the taking of the ice on the main channel of the St. Lawrence between Montreal and the sea, does not occur by the formation of a smooth sheet over its surface, nor by the widening of the border from the sides until the whole is covered as in small rivers, but by the formation of floating fields, which are kept in motion by tide or current, and which grow as they move, until one or more become of sufficient size and strength to block the narrow places of the river, as at Sorel island, at Cap Rouge and the island of Orleans. A blockade thus formed, if allowed to stand, arrests all floating ice which strikes it, the smaller floes are forced under by the tide or current, and there lodge until an ice jam of great thickness and strength is formed, and meanwhile the larger floes accumulate on the surface until the river above is covered. The experience in keeping open the winter ferry at Quebec has shown that by the skilful use of steamers of moderate power at the proper time and place, the formation of such blockades can be prevented, or if suddenly formed they can be broken up before attaining great strength; and that the floating fields having then nothing to hold them are kept moving by tide and current, and are carried off to sea before attaining sufficient size and thickness to seriously obstruct navigation.

"The conditions which prevail at Cap Rouge are so nearly the same as those at Quebec that there can be no doubt but that the Cap Rouge ice jam can also be prevented from forming, and with equal ease. In the winter of 1885-6 no blockade formed at Cap Rouge, and the main channel of the river also remained open from Three Rivers to the gulf, which goes to show that if Cap Rouge be kept free it should not be difficult to keep much more of the river open. It is well known that the Cap Rouge ice jam is the last point of obstruction to the clearing away of the ice above Quebec in spring, and that navigation up to Montreal is sometimes seriously delayed by its holding on to a late date. The average date of the opening of navigation at Montreal by the river steamers which winter above Cap Rouge is, for the last twenty-five years, April 19, but the average date of the first arrivals from sea is retarded until April 30. Allowing a day for ships to come from Quebec to Montreal leaves ten days average delay in the opening of navigation from sea, which may be fairly considered as caused by the holding on of the Cap Rouge ice jam. An ice-breaking boat of the power of the Stanley could by occasional work at proper times easily eliminate this delay; by additional work she could keep open all winter the channel up to the lower end of Lake St. Peter; and the same or a more powerful boat, by more constant work, and the skill which would be gained by experience would not only keep open the navigation channel through to Montreal but, as was pointed out by the Montreal flood commission of 1887, it would, by breaking up the ice at proper places and times, prevent the formation of heavy ice jams, and thereby prevent the disastrous winter floods of which they are the primary cause."

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Mr. Francis H. Clergue of Ontario, Can., is now en route home from England and the residents of Sault Ste. Marie have decided to give him a banquet in honor of his distinguished services to the town.

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The Robert Palmer Ship Building Co., Noank, Conn., has on hand one steam yacht, one fishing steamer, ten large sea-going barges and six floats.

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Green Bros., Bridgeport, Conn., have a contract to build a four-masted schooner of 2,500 tons for Capt. M. M. Blake and others of Bridgeport.

### REGARDING DULUTH GRAIN.

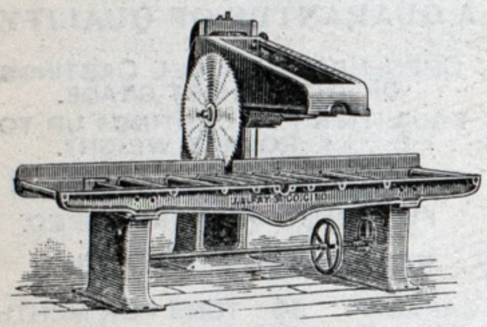
One of the Duluth vessel agents says of the freight situation at the head of the lakes: "There appears to be no activity in the grain market and the general situation is unchanged since one week ago. There is still no inquiry for tonnage for opening shipment. The weather continues cold. The ice in the harbor is 20 in. thick, and a few packs are now and then visible in the lake. The movement of coal is brisk."

Following is a table showing the quantities of grain in store at Duluth now, as compared with stocks a year ago:

| | 1900. | 1901. |
|---|---|---|
| Wheat | 7,524,868 | 6,922,477 |
| Barley | 160,139 | 74,617 |
| Flax | 204,188 | 331,598 |
| Oats | 182,476 | 890,586 |
| Rye | 267,645 | 283,133 |
| Corn | 339,884 | 1,783,342 |
| | 8,679,200 | 10,285,753 |

### FAY & EGAN WALL-BRACKET CUTTING-OFF SAW.

The illustration presents a new machine for sawing to accurate dimensions the heaviest timbers required in ship and navy yards. The saw-arbor is of large diameter, lead-ground and runs in a heavy frame with connected self-oiling bearings gibbed to the face of a massive cored bracket, the inner end of which is planed and fitted to a heavy wall plate, secured to a post or side of the building. The bracket carrying the saw-arbor has a vertical adjustment to compensate for wear of the saw, as well as dimensions of timber, so constructed that it always remains perfectly true with table. The saw-arbor frame is traversed over the table by a hand-wheel at the top, and will carry a saw 36 in. in diameter, and cut off material to 30 in. wide, and timbers 12 in. thick by 24 in. wide.



The table is long and fitted with wrought iron rolls; is of convenient height, and has a fixed fence at the back to retain timbers at right angles to the saw. The countershaft is placed vertically above the center of the arbor, leaving the floor clear of all obstructions. The manufacturers of this machine, J. A. Fay & Egan Co., West Front street, Cincinnati, will be pleased to furnish full particulars and prices to those interested, and will also send their new illustrated hanger free.

U. S. Engineer Office, St. Augustine, Fla., Jan. 26, 1901. Sealed proposals for building and equipping a steel hull, stern wheel, combined dredge and snagboat will be received here until 12 noon, Mar. 7, 1901, and then publicly opened. Information furnished on application. C. H. McKinstry, Capt., Engrs. Feb. 21.







### LUMBER CARRIERS FOR SALE.

| | | | |
|---|---|---|---|
| Stmr. White Star | capacity | 350,000 | feet. |
| Barge Eva S. Robinson | " | 560,000 | " |
| Schr. Annie P. Grover | " | 340,000 | " |
| Schr. John Miner | " | 350,000 | " |

All A2 and A2½ and in good condition. Arthur B. Slyfield, Port Huron, Mich. Feb. 21.

### WELLAND CANAL SIZE STEAMER WANTED.

Will charter for season of 1901 and would like privilege of purchase. Must have a speed of not less than 10 miles an hour, and must be in first-class condition. Send full particulars to Box 476, The Marine Review Pub. Co., Cleveland, O. Feb. 14.

### EXCURSION BOATS.

Two are wanted that will carry 400 to 500 passengers each. Season charter is offered. Draught not more than 6 ft. W. J. Ziegele, 502 Prudential Bldg., Buffalo, N. Y. Jan. 31

### RUDDER, WINDLASS, Etc., FROM WRECKS.

For Sale—Iron rudder from wrecked steamer St. Lawrence; steam windlass and capstan from wrecked steamer Tuttle; also chain and anchors from Tuttle. E. G. Crosby & Co., Muskegon, Mich. Feb. 7.

### WOLVERINE GASOLINE ENGINE FOR SALE.

Two cylinders, upright and of 47 H.P.; weight 5,500 lbs. Cost new $1,285. Used less than sixty days. In perfect order. Showed a brake test of 47 H.P. Spot cash price $775. Backus Gas Engine Co., 171 Lake street, Chicago, Ill. Feb. 7.

### LARGE PRIVATE SCHOONER-YACHT STARLIGHT

of Chicago for sale or can be chartered for private parties by the day, week or month. For charter apply to R. E. Smethells, Master, care of Columbia Yacht Club, Chicago. For terms of sale apply to L. F. Smethells, South Haven, Mich. Feb. 7.

### PATENT PROPELLER WHEEL.

Wanted, man to establish office in New York and look after sale of wheels. Already in use on hundreds of vessels. Rare opportunity for the right man. Address Manufacturers Patent Propeller, the Marine Review Pub. Co., Perry-Payne Bldg., Cleveland. d

### FOUNDRY AND MACHINE SHOP FOR SALE.

To close an estate. Located in one of the large cities on the lakes. Long established, well equipped, doing good business, marine and general. Splendid chance for the right parties. Will sell plant or lease for a term of years. Address "Administrator," care Marine Review Pub. Co., Perry-Payne Bldg., Cleveland. tf.

### TUG FOR SALE.

Good Tug, six years old. Engines 18x20. Boiler allowed 130 pounds steam pressure. Address Box 284, Ashland, Wis. Feb. 28.

### FIVE ELECTRIC PASSENGER LAUNCHES FOR SALE.

In fine condition. Length over all, 35 feet. Seating capacity, 28. Send for price list. Yacht brokers, please note. Milwaukee Electric Launch Co., 1504 Monadnock Block, Chicago. tf